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CONTENTS AND SUBJECT INDEX

The Modern Examination of a Patient with Chronic Indigestion. Franklin W. White, M.D., Boston.....571

The Rate of Progress of Food Residues Through the Bowel. Walter C. Alvarez, M.D., and B. L. Freedlander, M.D., San Francisco.....576

Lead Poisoning: Its Symptomatology and Diagnosis. Marvin D. Shie, M.D., Cleveland 580

The Prevalence and Distribution of Industrial Lead Poisoning. Alice Hamilton, M.D., Boston.....583

Absorption and Excretion of Lead. J. C. Aub, M.D.; A. S. Minot, Ph.D.; L. T. Fairhall, Ph.D., and Paul Reznikoff, M.D., Boston.....588

Papers of Drs. Shie, Hamilton, and Aub, Minot, Fairhall and Reznikoff discussed by Drs. Hanzlik, Hayhurst, Sollmann, Guthrie, Shie and Aub.

Appendix and Abdominal Diseases. C. H. Mayo, M.D., Rochester, Minn.....592

Metallic Mercury Suspensions: Therapeutic Results and Deleterious Effects of Their Intravenous and Intramuscular Injection. H. N. Cole, M.D.; J. G. Hutton, M.D.; John Rauschkolb, M.D., and Torald Sollmann, M.D., Cleveland 593

The Food Requirements of Malnourished Infants, with a Note on the Use of Insulin. W. McKim Marriott, M.D., St. Louis.....600

Discussed by Drs. Hess and Marriott.

The Case Against Gastro-Enterostomy. Donald C. Balfour, M.D., Rochester, Minn. 603

Discussed by Drs. Horsley, Sippy, Strauss, Morris, Mayo, Bartlett, Haggard and Balfour.

Comparative Methods of Protein Extraction. George Piness, M.D.; Hyman Miller, M.D., and Gordon A. Alles, B.S., Los Angeles.....608

Discussed by Drs. Black and Piness.

Habitual Hyperthermia During Recovery from Scarlet Fever. Heinrich Finkelstein, M.D., Berlin, Germany 611

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

Rupture of Fetal Membranes. Mildred Van Cleve, M.D., Macomb, Ill.....612

Instrument to Determine Difference in Expansion of Sides of Upper Chest in Pulmonary Tuberculosis. I. R. Wagner, M.D., New Haven, Conn..613

MEDICAL EDUCATION, REGISTRATION AND HOSPITAL SERVICE

Medical Statistics of Hospitals: Retrospect and Prospect. E. H. Lewinski-Corwin, Ph.D., and A. Eleanore Conover, M.D., New York.....634

EDITORIALS

Anaphylactoid Phenomena and Modern Therapy 614

Alkalosis as a Clinical Condition...615

Alcohol and the Heart.....615

Health of Children in Institutions..616

CURRENT COMMENT

Brinckmann's American Rhine Ruhr Relief 617

Muscular Weakness as a Symptom of Dietary Deficiency.....617

(Subject Index on next page)

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See Page 3

SUBJECT INDEX TO THIS ISSUE

The letters used to explain in which department the matter indexed appears are as follows: The Star (*) indicates an Original Article; "ab," abstract; "E," Editorial; "C," Correspondence; "T," Therapeutics; "Ml," Medicolegal; "P," Propaganda for Reform; "ME," Medical Economics.

Abdomen, gunshot and stab wounds of..ab-641
Acidosis ..ab-652
Acratothermae, action of..ab-651
Addison's disease, suprarenal transplant in ..ab-643
Agglutination, effect of globulin on..ab-646
Alcohol and heart..E-615
Alkalosis as a clinical condition..E-615
Alzheimer's disease..ab-648
Anaphylactoid phenomena and modern therapy ..E-614
Anemia, pernicious, and syphilis..ab-649
from Taenia solium..ab-652
prognosis of..ab-652
Anesthesia in children..ab-653
Appendices epiploicae, hernia of..ab-648
Appendix and other abdominal diseases..*592
Arsphenamin injuries..ab-652
lime-arsphenamin treatment..ab-650
Asphyxia neonatorum, reanimation in..ab-654
Asthma, autogenous vaccine therapy of..ab-642
Auricular flutter..ab-641
Bacillus coli, pathogenicity of..ab-645
Bacteria, elimination of..ab-651
Bedbugs, transmission of spirochetosis..ab-648
Bile ducts, operative injury of..ab-648
pigment, formation of, after hepatectomy, ..ab-640
Bilharziasis, calcium chlorid in..ab-647
Bilirubin metabolism in new-born..ab-654
Bismuth intravenously, sudden death after ..ab-650
Blanchard, Raphael, monument in memory of ..626
Blood cholesterol, high, and suprarenals..ab-647
cholesterol in gangrene..ab-649
diastase ..ab-640
glycolysis and phosphorus in..ab-648
group II ..ab-644
grouping in infants..ab-649
pressure during laparotomies ..ab-647
pressure, high, kidney function in..ab-649
sugar curves in fasting nondiabetics..ab-646
urea, influence of epinephrin on..ab-648
Book Notices..638
Books Received..Adv. page 28
Botulism anatoxin ..ab-647
Brain, hydatid cyst of..ab-644
Breast cancer, diagnosis of..ab-652
Brinckmann's American Rhine Ruhr Relief ..E-617
Caisson disease ..ab-654
Caliper for chest expansion in tuberculosis..*613
Cancer and endemic goiter..ab-648
Carbohydrate diets, high, use of..ab-646
metabolism and albumin-fat diet..ab-646
tolerance, increase in, after insulin..ab-653
Cataract in eczema ..ab-654
secondary, treatment of..ab-654
Cerebellum affections, arm tonus in..ab-651
function of ..ab-650
Child welfare in Prague..627
Chinese, mortality of, in U. S..ab-639
Chloroform and epinephrin ..ab-647
Circulation, metabolism in affections of..ab-651
Colloid treatment ..ab-652
Correspondence ..632
Cowpox, generalized, in rabbits..ab-648
Death rate, misleading conclusions..622
Deaths ..630
Diabetes, antiketogenic diet in..ab-644
refractory to insulin..ab-651
Diarrhea, hypocalcemia in..ab-647
Diet deficiency, muscular weakness in..E-617
Diphtheria-anatoxin test ..ab-647
avoiding tracheotomy and intubation in..ab-650
carriers, gentian violet for..C-632
cutaneous test for..ab-651
Dyspnea from acidemia and alkalemia..ab-645
Eclampsia ..ab-653
Encephalitis, myoclonic, own spinal fluid in ..ab-645
Endocarditis, infectious, metabolism in..ab-649
Enterococcus, intradermal vaccine test for ..ab-648
Epinephrin, action of, by mouth..ab-650
and basal metabolism ..ab-639
and chloroform ..ab-647
influence of, on blood..ab-648
Erythrocytes, sedimentation test..ab-653
sedimentation test in gynecology..ab-653
sensitized, sedimentation speed of..ab-650
Eyelids, elephantiasis of..ab-654
Eyestrain as cause of migraine..ab-646
Fees, services to third person..Ml-638
Food poisoning and bacteria..ab-640
residues, rate of progress of, through the bowel ..*576
Foreign Letters..624
Furunculosis, hemotherapy of..ab-653
Gallbladder, duodenal drainage of..ab-642
excision and gastric secretion..ab-642
Gangrene, cholesterolemia in..ab-649
Gastro-enterostomy, case against..*603
Gastroscope ..ab-653
Gentian violet for diphtheria carriers..C-632
Glasses, dispensing of..C-633
Glaucoma, treatment of..ab-654
Goiter, endemic, and cancer..ab-648
individual treatment of..ab-653
Government Services..623
Health examinations, periodic..620
universal health control, Vienna..628
Heart, calcification of ..ab-642
prolonged electrocardiography of ..ab-649
Hemotherapy for wounds..ab-651
in furunculosis ..ab-653
of infected wounds..ab-653
Heterochromia ..ab-654
Hospitals, medical statistics of..*634
Hydrothorax, rapid reproduction of, in syphilitic ..ab-649
Hygiene, military, council for..627
Hypernephroma ..ab-644
Hyperthermia after scarlet fever..*611
Hyperthyroidism, fatal, from iodin..ab-649
iodin treatment of..ab-654
Immunity, nonspecific ..ab-648
Indigestion, examination of a patient with..*571
Infants and summer heat..ab-651
examination of eyes of..633
malnourished, food requirements of..*600
suffocation of, from gruel..ab-651
Infectious diseases, heredity and predisposition in ..ab-650
Inferior oblique muscle, development of..ab-654
Institutions, health of children in..E-616
Insulin administered by tongue..ab-647
increase in tolerance after..ab-653
inhibiting action of hyperglycemia on..ab-648
intratracheal administration of..ab-650
Insurance, health, and physicians in Berlin ..628
Intellectual work, international cooperation in ..626
Intestines, jejunostomy for acute obstruction of ..ab-641
postoperative paralytic ileus ..ab-652
prevention of acute obstruction of..ab-641
progress of food residues through..*576
protozoa of, carnivorous diet unfavorable to ..ab-639
Iodin hyperthyroidism, death from..ab-649
Jaundice, hemolytic, in children..ab-651
Keloids, roentgen-ray treatment of..ab-641
Kidney calculi, causes of..633
Labor, Kielland forceps in..ab-654
early rupture of fetal membranes..*612
Lead absorption and excretion in the organism ..*588
poisoning, industrial ..*583
poisoning, source of ..ab-650
poisoning, symptomatology and diagnosis..*580
Lens, orbicular phenomenon of..ab-654
Leptospira in rats of Baltimore..ab-639
Leukemia, aleukemic ..ab-649
Leukocytes, locomotion of ..ab-639
Leukorrhea and its treatment..ab-651
Liver excision, effect of, on urea..ab-640
excision, formation of bile pigment after ..ab-640
London, health of..624
Lugeol, P., death of..626
Lung, massive collapse of..ab-640
Lymph nodes, bronchial, tuberculosis of..ab-654
mastoid adenitis ..ab-649
Lymph pressure ..ab-644
Lysozyme, effect of vaccines on..ab-645
Malaria, congenital ..ab-647
Marriages ..629
Masturbation in infants..ab-649
Measles, antibodies in ..ab-649
intradermal reaction in..ab-649
prophylaxis of, with adults' blood..ab-652
Medical education, current criticisms of..C-632
in Prague ..626
Medical Education, Registration..634
Medicolegal ..638
Meningitis, diagnosis of..ab-652
Menstruation, sugar metabolism in..ab-651
Mercuric iodid, hemolytic action of..ab-649
Mercury suspensions, metallic..*593
Metabolism, basal, and epinephrin..ab-639
Migraine from eyestrain..ab-646
Milk supply, clean, in London..624
supply, regulations of, in Paris..626
Moonshine poisoning, nature of..ab-640
Mosquito protection of water tanks..ab-646
Muscle, mechanism of contracture of..ab-648
pains and stiffness in..ab-652
Nephrolithiasis and ureterolithiasis, coexistent ..ab-642
News ..618
Nurses, duties of, in Germany..629
Osteitis deformans, kidney function in..ab-642
Osteopsathyrosis, idiopathic ..ab-642
Pellagra, defective protein theory..ab-642
Peptic ulcer, hemorrhage, treatment of..ab-653
surgical treatment of ..ab-653
Percussion, lung ..ab-643
Perspiration, insensible ..ab-639
Physicians' families, maternal and infant mortality in ..ab-639
Physiology, clinical, importance of..ab-645
Pituitary, effects of removal of..ab-648
tuberculoma of ..ab-645
Poliomyelitis, biseasonal prevalence of..ab-639
at Syracuse, N. Y..620
diathermy for paralysis from..ab-652
Potatoes, carbohyrate content of..ab-648
Pregnancy, vomiting in, treatment of..C-632
Propaganda for Reform..631
Protein extraction, comparative methods of ..*608
Pseudohemophilia ..ab-652
Queries and Minor Notes..633
Rabies, etiology of ..ab-649
Reflex, mesenteric ..ab-639
Respiratory capacity and sitting height..ab-649
Reticulo-endothelial cells, receptivity of..ab-652
Rheumatism, articular, and tonsils..ab-654
Roentgenology, opaque mass for..ab-644
Roentgen-ray examination, required before trial ..Ml-638
Salt solution, hypertonic, and intestinal absorption ..ab-643
Sarcoma, in vitro strain of..ab-650
influence of lymphopoiesis on..ab-647
Scapular types ..ab-642
Scarlet fever, Dochez serum for..ab-643
hospital epidemic of..ab-647
hyperthermia after ..*611
pathogenesis of ..ab-650
Schick test, research on..ab-647
Sclerosis, disseminated ..625
Scurvy and tuberculosis..ab-647
Silica determines site of tuberculosis infections ..ab-645
Silicosis, compensation for..624
Society Proceedings..638
Speech disorders, congress on..627
Spirochetosis, epidemic, in dogs..ab-647
transmission of, by bedbugs..ab-648
State Board Examinations..634, 636
"Sterilet" infection ..ab-648
Stomach, primary sarcoma of..ab-642
secretion, effect of cholecystectomy on..ab-642
Suprarenals and high cholesterolemia..ab-647
Sympathicotonia, experimental ..ab-651
Syphilis, flocculation and complement fixation in ..ab-646
Tactile regions, glomus of..ab-648
Taenia solium, pernicious anemia from..ab-652
Teeth caries, bacterial factor in..ab-645
caries, etiology of..ab-645
Tetany from overbreathing ..ab-653
Thrombosis of inferior cava..ab-641
Thyroiditis, chronic productive..ab-641
Tonics and Sedatives..Adv. page 22
Tonsils and articular rheumatism..ab-654
radiotherapy for cancer of..ab-640
Trichinosis in Karlsruhe ..ab-650
Trousseau's phenomenon ..ab-651
Trypanosomiasis, treatment of..ab-647
Tubercle bacilli and magnesium sulphate..ab-648
examination of sputum for..ab-640
permeability of conjunctiva for..ab-654
Tuberculin tests after operations..ab-648
Tuberculoma of pituitary..ab-645
Tuberculosis and disordered heart action..ab-643
and scurvy ..ab-647
artificially induced anisocoria in..ab-649
defatted antigens in complement fixation for ..ab-645
Dreyer's tuberculo-antigen ..ab-643
infections, silica determines site of..ab-645
inhalation treatment of..ab-651
peritoneal and genital ..ab-653
pulmonary, calcemia in..ab-647
pulmonary, overdiagnosis of..ab-643
Ukrainians in Prague..627
Urea, effect of hepatectomy on..ab-640
Urine, incontinence, treatment of..ab-649
Urobilin in excreta of new-born..ab-654
Uterus, dangers from obturators in..ab-648
sense of feeling of instruments in..ab-653
Vagus pressure experiment..ab-652
Vanilla poisoning, so-called..ab-650
Venereal diseases, reporting of..Ml-638
Water, elimination of..ab-650
Wounds, hemotherapy for..ab-651, ab-653
Yadil, exposure of, in England..625

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THE MODERN EXAMINATION OF A PATIENT WITH CHRONIC INDIGESTION *

FRANKLIN W. WHITE, M.D.
BOSTON

The examination of the patient is a search for the truth. We need accurate methods, good logic, and good judgment in conclusions, with no undue stress on any fact. There is a complaint that laboratory methods tend to make a less keen clinician. This is not necessary. The new facts enlarge his scope and should help him to make more accurate diagnoses.

Our examination may be divided into (1) what we always do; (2) what we usually do, and (3) what we occasionally do. Since we can rarely use all our methods, good judgment is needed in selecting the tests to use in an individual case. We do not want to miss anything important and we do not want to waste time. Mistakes may sometimes be made, and a test omitted which is the key to the diagnosis, i. e., a Wassermann test, a roentgenogram of the gallbladder, a pancreatic test, or an examination of the feces for blood.

We develop a certain routine, which is complete without being too elaborate, and add special features to it as needed. In this way, with all our examinations, we spread a net through which few diseases escape. An enthusiast may take an "occasional" test, such as biliary drainage, or stool tests for blood, and use it "always."

Some tests are easy for the family practitioner, such as the taking of the history, the physical examination, the examination of the feces and perhaps the use of the stomach tube. Other tests, such as the roentgen-ray examination, or tests of liver or pancreatic function, usually mean a visit to a special or hospital clinic. There is always a strong effort to simplify every test, so that as many as possible may be freely used by the general practitioner. The routine is as follows:

What we always do:

Take a careful history. This is usually more complete and systematic if a form sheet is used.[1]

Make a general physical examination (including throat, teeth, skin, lungs, heart, blood pressure, abdomen, reflexes, urine, hemoglobin, etc.).

Analyze the stomach contents, with the patient fasting, or after a test breakfast, or both.

What we usually do:

A roentgen-ray examination of the gallbladder region, and after a barium meal.

Examine feces on ordinary or meat-free diet.

A Wassermann reaction.

What we occasionally do:

A barium enema.

A biliary drainage.

Tests of liver function.

Tests of pancreatic function.

The exploratory operation is somewhat neglected. This is a tribute to our accuracy. If nothing is found, the surgeon hesitates to open the abdomen. This hesitation may be overdone, especially in the difficult cases, such as early or nonobstructive cancer, some gallbladders and some pancreatic cases.

New methods constantly appear and have to be sifted out with much time and trouble. This is laborious, but it is the price of progress. It is the part of the young workers to carry out these investigations. It is the part of the experienced clinicians to stimulate and supervise this work, and, finally, to sum up the results in a critical spirit and see whether the new method is worth its salt. We want no new methods unless they are useful. We want no elaborate examinations unless we are sure of their value.

HISTORY AND PHYSICAL EXAMINATION

In spite of the importance of this examination, we can mention only a few points. Some diagnoses are habitually easy, others are usually hard. For example, it is easy to locate disease in the esophagus, to diagnose duodenal ulcer or ptosis, or colitis, or intestinal obstruction. It is hard to find an early or nonobstructive cancer, or pancreatic disease, or a latent pathologic gallbladder. In other words, some types of cases need much more intense study than others, to avoid mistakes. We like to simplify the diagnosis, but often a double lesion is present, such as a pathologic gallbladder and a pathologic appendix, or an ulcer and a diseased appendix, or multiple ulcers. Irregularity of symptoms is often due to adhesions involving other organs, e. g., the gallbladder or appendix.

The differentiation of ulcer and cancer of the stomach is usually easy, but may sometimes be hard or impossible. Experienced clinicians everywhere agree that cancer of the stomach is almost always primary and rather rarely the sequel of a chronic ulcer, probably not more than 5 per cent. of gastric ulcers changing to cancer. This makes us more comfortable about diagnosing ulcer in patients who have had years of digestive trouble.

Obstinate resistance to treatment makes one suspect an organic lesion. We make the diagnosis of "nervous hyperacidity" much less often now in chronic, serious cases. We usually expect to find an ulcer, a pathologic appendix or a pathologic gallbladder behind the illness. Rarely a persistent hyperacidity and other digestive symptoms are due to a stone in the kidney or ureter, which is otherwise latent. We must not confuse high secretion and the syndrome "hyperacidity" (hunger

* Chairman's address, read before the Section on Gastro-Enterology and Proctology at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. Such as the author's form sheet in Nelson's Loose-Leaf Medicine 5: 124.

pain or distress with acid eructation and food or soda relief). We find high secretion in young, strong persons. We find "hyperacidity" in sick people; it is chiefly a motor phenomenon.

Factors outside the digestive tract should always be kept in mind. When symptoms of indigestion depend closely on exercise, we should think of the heart. Here the use of digitalis is a valuable therapeutic test. Every year we see cases of well developed tuberculosis of the lungs which have been masked by symptoms of indigestion and overlooked. The achylia cases form a most interesting group in which every other examination, including that of the blood, is negative, and which a year or two later show pernicious anemia. Another group that is constantly overlooked is that of the late syphilitic cases, whose only symptoms are of indigestion. Here the early history and the blood or spinal Wassermann test solve the problem. Migraine vomiting is often called "stomach trouble" by the patient. The history is usually a sure guide.

Chronic pancreatic disease is almost always obscure and many wrong diagnoses are made. Jaundice is usually not an early symptom. We want all the laboratory help possible; if chronic pancreatic disease is suspected, the physician should always examine the duodenal contents as well as the stools, for enzymes, blood, etc.

We should be slow in diagnosing chronic appendicitis as a cause of symptoms of indigestion unless there is a good history of previous acute or recurrent attacks and no other cause is found. This diagnosis is much too frequently made. Fully one half of the patients whose appendix is taken out for chronic indigestion (not acute attacks), come back with the story that they have found no relief from operation. A careful history taking would have saved many of these patients a needless operation. Many have an ulcer or gallbladder disease. More still have a purely functional, not organic, indigestion.

This is in direct contrast to gallbladder disease, in which many cases are overlooked, and the diagnosis not made often enough. Fully half of the patients have no local symptoms, no colics, no right-sided pain, soreness or tenderness, no jaundice. They simply complain of vague indigestion, gas, distress, heartburn, nausea. They masquerade as having "intestinal indigestion" and "gastric neurosis," and we are often disagreeably surprised later to find that they have had a successful operation and that we have overlooked another pathologic gallbladder.

We like to have one test back up another, and we do not take a deformity of the duodenum so seriously if the history does not even suggest a duodenal ulcer. On the other hand, we have to accept the roentgen-ray evidence of a clear, undoubted gallstone or a definite gastric ulcer or an hour-glass stomach, whether the history is characteristic or not.

ANALYSIS OF GASTRIC CONTENTS

It will be a comfort to the practitioner to know that there is a strong and growing tendency to give up fractional examinations of stomach contents in routine work and to go back to the single one-hour test.

In many of our leading clinics, fractional tests have been given up, except for the group of low acid cases, as not being worth the time they take, because they are less easy for the patient and because of certain definite objections, the most important being that the small fractions taken out are not representative of the stomach contents as a whole, because the latter are not well mixed.

Pawlow and Cannon and others have pointed out that the stomach is a poor mixing machine, and this has been recently emphasized by Dr. F. D. Gorham[2] of St. Louis and confirmed in a series of 500 analyses that I[3] performed. If one fraction of stomach contents gives an acidity of 15, another fraction, taken at the same time, 30, and another, 50, so-called "fractional curves of secretion" lose their interest.

Motor changes (which, of course, are much more important than secretion) are readily found in other ways: the twelve hour motor test or six hour barium meal. Pathologic products, such as mucus, pus, blood, epithelium and bacteria, are easily found with the single test, or in the fasting contents.

We must remember that secretory figures vary much in the same patient from day to day because there are so many factors affecting the secretion, the general condition, mental and physical strains, mucus, duodenal regurgitation, the psychic effect of the intubation, etc., and reexamination is very important. We must not lay too much stress on one analysis, whether single or fractional.

A fractional test takes about one and one-half or two hours. If even a small part of this time were spent in reexaminations of the same patient, taking only a few minutes each time, on different days, probably much more of value would be obtained.

The test of the value of this and every clinical method is the question: Does it give enough added information to warrant its use? We may easily spend time on a complicated test, and plot curves which look scientific and slight more important things, such as careful history taking and a diagnostic study of symptoms. If thousands of patients are to sit for hours with tubes in their mouths, we must have something important to show for all this valuable time spent, something which cannot be obtained from the fasting contents and single meal.

We may combine the simplicity of the single tube test with the advantage of the fractional method in low acid cases, by passing the Rehfuss tube at the end of three quarters of an hour to one hour. If plenty of gastric secretion is found, the stomach may be emptied and the test closed. If secretion is low or absent, the tube is left in, and fractions are taken till the stomach is empty. In this way, normal secretion cases are quickly disposed of, while low secretion cases are thoroughly followed up.

Only gross changes in secretion have any medical value. We are interested to know whether secretion is high, low or absent, not in mathematical details. A knowledge of secretion is often of more value in treatment than in diagnosis. Unfortunately for the practitioner, examinations of the stomach contents are not really easy, like examinations of the urine. The family physician often thinks they are too much trouble and starts his treatment without knowing whether gastric secretion is high, low or absent. Such therapeutic procedures are blind work.

In the case of ferments, for example, it would be ridiculous, if it were not so sad, to think of the enormous economic waste, the careful preparation of animal and vegetable ferments, the bottling, the advertising, the selling, the cost to the patient of something which

2. Gorham, F. D.: Variations of Acid Concentration in Different Portions of Gastric Chyme, and Its Relation to Clinical Methods of Gastric Analysis, Arch. Int. Med. **27**: 434 (April) 1921.

3. White, F. W.: Simultaneous Variation in Acidity of Different Portions of Gastric Contents, J. A. M. A. **79**: 1499 (Oct. 28) 1922.

so frequently is entirely wasted, something which he already has in abundance and of which the extra supply is not worth a cent to him. How quickly the use of ferments would drop if the family physicians tested their patients' stomachs and gave these preparations in only the small percentage of cases in which they are actually needed.

A glance at the formulas of the manufacturers or at the prescriptions of physicians, shows that common facts in the physiology of digestion are disregarded and that ferments are combined and given to patients without much care or common sense. Most of the ferment formulas are harmless, but could not possibly help digestion.

Our present titration methods for finding the acidity of the stomach contents do not meet modern scientific standards. We may have to change them entirely and find out how much ionized acid is present. This is the truly active acid, the one on which the activity of the pepsin entirely depends. Hydrogen ion concentration methods may change our gastric analysis entirely, just as they have changed nearly all other chemical analysis. No one, for example, would think of using anything but p_H methods in the pathologic laboratory for finding the reaction of mediums for bacterial culture. Fortunately for the old titration methods, I [4] have found that, in the stomach contents, at a stated time (one hour) after a uniform test breakfast given on an empty stomach, the buffer bodies are small in amount and fairly constant, and the more accurate p_H analysis agrees well with the old titration methods in most cases.

It is important in gastric analysis to use a stable, uniform test meal. "A slice and a half of bread" may mean fresh bread, dry bread, well baked or poorly baked bread; white, graham, whole wheat or rye bread. A simple meal, such as a shredded wheat biscuit or six arrowroot crackers (National Biscuit Company) is surely much more definite and uniform.

BILE DRAINAGE

Bile drainage is a new and very interesting method of examination. Dr. Lyon makes a strong plea for an early diagnosis of the pathologic gallbladder by a direct method at a time when the history and physical examination are doubtful and the roentgen ray shows no pathologic changes. I am convinced that the method has some value in diagnosis, but the degree of value is not determined yet.

Some of the early interest and enthusiasm for biliary drainage has cooled as the limitations of the method are recognized and an increasing number of cases are checked by operation. The method has not realized all its original claims (few new methods do), and the question is asked in many clinics and laboratories whether or not the method is worth the time it takes.

It is difficult to estimate its total value at this time, although it has been in use for several years, and much has been written about it. There is much contradictory evidence at present, both clinical and experimental. The clinical papers are written almost entirely by those who have found the method useful in their own experience. Other trained men have tried it, have been disappointed and have given it up, and their names do not appear in the literature; but I have found there are many such from personal interviews. Unfortunately, there are some men who have criticized the method freely without giving it a fair trial or any trial at all.

4. White, F. W.: Unpublished data.

The physiology on which the method rests has been questioned. While there is no doubt about the relaxation of the common duct sphincter by magnesium sulphate, or the flow of bile after its use, there is much doubt about the contraction and degree of emptying of the gallbladder. It is probable that most of the bile obtained in a drainage comes direct from the liver and larger bile passages.

An estimate of the value of the method in diagnosis is formed from two classes of cases, a smaller group, of patients operated on, with a definite check on the method, and a far larger group of patients not operated on, in which we have no definite check. In the first group, the method has shown up well in diagnosis; but, of course, these are, as a rule, the more serious or well marked cases.

The second group is quite different. In these milder cases, suspected of pathologic gallbladder, the diagnostic details of color change, cells, crystals and cultures may appear conclusive to one man and not to another. When this second group is very large in a reported series, say 80 per cent., and many are so-called "masked infections," with no definite symptoms or signs except the evidence from bile drainage, we are on uncertain ground.

The method is somewhat elaborate and time consuming with its intubation, lavage, aspiration, microscopy, cultures, repetition of the drainage, and often the use of the roentgen ray. There is difficulty in localizing the disease in the bile passages. Many of the cells seen are evidently from the duodenum. A study of sediments from opened pathologic gallbladders has proved disappointing for diagnosis. There is a minority of distinctive cultures and an abundance of colon bacilli and other bacteria of doubtful significance. The variety of opinions about the importance of color change, crystals and cultures shows some uncertainty in the method at present.

On the other hand, biliary drainage has given us a definitely better diagnosis in a limited number of cases: (*a*) The acute inflammatory cases, cholecystitis and cholangeitis and exacerbations of chronic cholecystitis quite often show an abnormal bile, thickened or darkened, with bile stained epithelium, pus cells and mucus, and some distinctive cultures of the pus organisms or the colon bacillus. (*b*) No dark or B bile is usually found with a blocked cystic duct, a gallbladder full of stones, or one that does not empty. (*c*) No bile is found in common duct obstruction (stones, cancer, etc.). (*d*) An excess of crystals is occasionally found in gallstone cases.

Clear bile with cultures usually sterile is found in normal persons, gallstone cases and some cases of chronic cholecystitis.

Whether or not the method gives us an adequate diagnostic return for the time spent will be decided, no doubt, in the next few years. My views of its present status are given in a recent paper.[5]

TESTS OF LIVER FUNCTION

The liver is our largest gland. It has many important functions in sugar, fat, and protein metabolism, destroying poisons, taking care of old red blood cells, and the excretion of bile. Many functional tests of the liver have been used, for sugar tolerance, nitrogen partition, lipase in the blood, the excretion of dyes, etc. Some tests, such as Widal's hemoclastic shock of 1921, have soon been found wanting and discarded.

5. White, F. W.: Modern Diagnosis of Diseases of Gallbladder, M. Clin. N. Am. 7: 909 (Nov.) 1923.

I will speak of only one recent method, the phenoltetrachlorphthalein test, a permeability test something like the phenolsulphonephthalein test of the kidney. This was devised by Rowntree [6] about ten years ago and has been much used and improved of late. The dye was first tested for in the feces; then in the duodenal contents, by McNeil [7] in 1916; and now the test is made to see how rapidly the liver removes the dye from the blood.[8]

The technic is not difficult. A given dose of the dye per body weight is injected into a vein and the rapidity of its removal from the blood is judged by a color test of the blood serum at intervals for several hours. The dye is irritating, so it must be diluted and must not be spilled in the subcutaneous tissue.

The older test in the duodenal contents leaves us in the lurch when there is common duct obstruction by stone, stricture or growth; namely, in just the type of case in which it is so important to know the amount of damage to the liver cells, in order to estimate the liability to shock after operation. The Rosenthal test of the blood is far better in this respect, since it is not interfered with by common duct obstruction.

The most serious difficulty in any liver function test is the large margin of safety in the liver. This is very valuable to the individual, but hard for the test. It will be remembered that McMaster and Rous [9] tied nine-tenths of the bile ducts before secretion lessened, and in phosphorus poisoning experiments only very late positive results were found by Whipple [10] with the phenoltetrachlorphthalein test in the feces, after most of the liver was damaged. The objection was found in the earlier tests that all methods failed to show slight changes in the liver and that positive tests were chiefly obtained in cases of extensive disease of the liver, in which the clinical evidence was often sufficient (cancer, chronic hepatitis). In most serious cases that I myself have tested, it has usually been possible to predict the test, so that it has been of less help than we expected.

On the other hand, it is the most promising liver function test we have at present, and there is a reasonable hope that with further experience it will prove a valuable guide to the extent of liver damage in less severe types of liver disease, such as infectious jaundice, gallbladder infections with liver involvement, and post arsphenamin cases. New and important work is now being done.

FUNCTIONAL TESTS OF THE PANCREAS

Despite the fact that the pancreas is by far the most important of the digestive glands, few pancreatic tests are made in general practice, and, if used at all, simple methods have been employed, which give only approximate results. The excuse is that pancreatic disease is somewhat rare, that the compensatory action of the pancreas interferes with such tests, that there is the necessity of getting duodenal contents, and, lastly, that there are technical difficulties in the making of accurate tests. The early methods were rather rough, because no attention was paid to the physical chemistry of the duodenal contents, and its effect on enzymes, which makes it somewhat difficult to interpret the results obtained.

Enzymes are very delicate and the tests must be very carefully arranged; otherwise they are variable or useless. Unfortunately, a good test is a rather complicated affair and not a practitioner's method, like tests of the urine or blood. For the most accurate tests, a laboratory technician is needed, much as in the case of a Wassermann test. With duodenal intubation (and perhaps the use of a fluoroscope) and technical analyses, they are limited at present largely to hospital use.

If it proves possible to simplify the tests and yet leave them sufficiently accurate for clinical purposes, it will greatly extend their use in the diagnosis of diseases of the pancreas itself and will probably discover many cases of chronic indigestion, of gallbladder disease and of diabetes which show interesting and important changes in pancreatic function. We should not examine the urine for albumin nearly so often if we had to do a Kjeldahl test instead of a heat or nitric acid test. The first is more accurate; the latter will do for clinical work.

The physical chemistry of enzyme action is very important; enzymes are markedly affected by the acidity or alkalinity (p_H) of the medium in which they act. This reaction is kept constant largely by the amount and efficiency of the buffer substances present (those bodies which resist changes in the p_H value on the addition of acid or alkali).

McClure [11] of Boston has taken the work of the physical chemist on enzymes and developed methods that are much freer from criticism, as far as physical chemistry is concerned, than most or all of the methods used before. The methods are somewhat elaborate; perhaps they have to be. Time will tell. Their complexity has proved a bar to their general use thus far. Simpler methods are very desirable.

The most striking results of recent work are that: 1. Pancreatic ferments are low in chronic pancreatitis and cancer of the head of the pancreas (though they may be normal in cancer of the pancreas when the head is not involved). 2. The ferments are rather low and often dissociated in acute pancreatitis; also in obstruction of the pancreatic duct by stone or sclerosis. 3. Ferment tests have real value in obstructive jaundice in localizing the lesion and in differentiation of malignant and benign lesions; e. g., in cancer of the pancreas head, enzymes are low and in stone in the common duct they are normal.

Careful, even elaborate methods of testing the duodenal contents for ferments are worth while, because examination of the stools may give no clear sign of pancreatic deficiency, especially if bile is absent from the bowel; also, bacterial enzymes in the bowel may mask the lack of pancreatic enzymes.

In comparing the results in McClure's cases with some older series, such as those of Crohn [12] or myself,[13] it is seen that, in general, the results are very similar in the older cases, though probably less accurate and definite in the individual case, because the methods are less accurate. It is important to remember three things:

1. If in doubt about pancreatic function, one should test the duodenal contents.

2. We now have good tests of pancreatic function, which are both accurate and diagnostic.

3. There is a hope that we may be able to simplify them.

6. Rowntree, Hurwitz and Bloomfield: Bull. Johns Hopkins Hosp. **24**: 327, 1913.
7. McNeil, H. L.: J. Lab. & Clin. Med. **1**: 822 (Aug.) 1916.
8. Rosenthal, S. M.: New Method of Testing Liver Function with Phenoltetrachlorphthalein, J. A. M. A. **79**: 2151 (Dec. 23) 1922.
9. McMaster, P. D., and Rous, Peyton: J. Exper. Med. **33**: 731 (June) 1921.
10. Whipple: Bull. Johns Hopkins Hosp. **24**: 357, 1913.
11. McClure, C. W.; Wetmore, A. S., and Reynolds, L.: New Methods for Estimating Enzymic Activities of Duodenal Contents of Normal Man, Arch. Int. Med. **27**: 706 (June) 1921.
12. Crohn: Am. J. M. Sc. **145**: 393, 1913.
13. White, F. W.: Tr. A. Am. Phys., 1915.

THE ROENTGEN-RAY EXAMINATION

We all recognize the vast importance of the roentgen-ray examination. It is essential to accurate diagnosis. No other single method compares with it for the discovery of gross lesions in the abdomen. This fact may make us slight other methods of examination.

There is a recent tendency to study digestive cases less carefully, to take a less careful history, and make a less thorough physical examination, to omit tube tests and make no examination of the feces, but to send the patient at once to the roentgenologist and accept his report as final. This is very undesirable, because while the roentgen ray will discover gross lesions in the abdomen, it will overlook most of the functional changes, which make up the majority of digestive troubles. A roentgen-ray report of "no pathologic changes" in a case of indigestion does not mean that the patient is well. He may have achylia, hyperacidity, chronic gastritis, colitis, or even early or nonobstructive cancer of the fundus or posterior wall of the stomach, colon or the mesenteric or retroperitoneal glands, or pancreatic disease, or, often enough, gallstones, nephritis or anemia. It is obvious that we must not neglect our general examination merely because the roentgen ray is so remarkable.

Whenever there is a conflict between the clinical findings and the roentgen-ray report, the case needs careful study, as either method may be wrong. It is valuable to check up one method of examination by another, the roentgen ray by the tube test, or examination of the feces for blood. In this way, serious mistakes are avoided. One should look out for the case with a negative roentgen-ray report and constant blood in the stools.

On the other hand, there is a considerable number of cases in which the diagnosis could not be made without the roentgen ray, such as diverticula of the esophagus, stomach or bowel, diaphragmatic hernia of the stomach or bowel, hour-glass stomach, foreign bodies, some latent cancers and gallstones, benign tumors, and adhesions of the stomach and bowel. It also gives us unique information about peristalsis, tone, spasm, and the emptying of the digestive tract and about the condition of postoperative openings.

Ulcer.—Ulcer of the stomach and duodenum is discovered and located with an accuracy found in no other clinical method, but even here we want the history and roentgen-ray examination to fit together. We have already suspected three fourths of the ulcers which the roentgen ray shows and we are very suspicious of slight deformities of the duodenum if the history does not agree with duodenal ulcer.

I have a suspicion that we are diagnosing too many duodenal ulcers in cases in which the patient has a definite "hyperacidity" syndrome, the roentgen-ray examination shows deformity of the duodenum, and a reexamination after the use of atropin gives the same deformity. Atropin does not always relax spasm, even in large doses, and occasionally a duodenal spasm is called ulcer. The patient is not operated on, but is cured by the usual "ulcer" treatment, and we have no check on the diagnosis.

Cancer.—The diagnosis of early cancer by the roentgen-ray has been very disappointing. The roentgen-ray reports are mostly of the late cases. There are two reasons for this, the first being the limitations of the method. The early anatomic changes, like the symptoms and other signs, are hard to recognize; the earlier the cancer, the less clear the evidence. Early cancer of the esophagus may be missed or called spasm. This is a serious mistake; the "spasm" may be an early sign of the cancer. In the stomach, an early cancer in the fundus or posterior wall may not be found. The fundus fills poorly, and the posterior wall is not seen in profile. In the colon, it is easy to miss a nonobstructive lesion. The imperfectly filled colon at the end of twenty-four hours is a great source of error. The routine barium meal without an enema is often not enough for diagnosis. The second reason for failure to diagnose early cancer is the scarcity or lack of early symptoms, and the long delay in getting the patient to his first roentgen-ray examination. This is especially true in nonobstructive cancer. There is delay all along the line. The patient feels quite well at first, does not take his slight indigestion seriously, and does not see his physician for a month or two. The physician thinks that the patient looks quite well, and the symptoms are mild; another month or two may go by before he is sent to the roentgenologist, and the first roentgen-ray examination shows a lesion that is no longer early. We may not be able to change our methods of examination at once, but we can at least have patients of cancer age examined more promptly.

Ptosis.—The roentgen-ray examination tells us the exact position of the abdominal organs. It is responsible for a multitude of diagnoses of ptosis of the stomach and bowel and is partly responsible for an enormous amount of treatment by diets, exercises and belts. It is interesting to find that Moody, Van Nuys and Chamberlain [14] have shown that a low position of these organs is very common in healthy, vigorous young adults who are entirely free from symptoms of indigestion. The average position of the greater curvature of the stomach was 1 inch below the interiliac line (navel) in men and 2 inches below in women, with extremes of 6 inches below in men and 7 inches below in women, with the position of the colon correspondingly low. It is obvious that we should not make so many diagnoses of gastro-intestinal ptosis and that the improvement that comes after resting, feeding and exercising weak persons is due to an improvement of their general condition and not to change in position of the stomach and colon.

Diseases of Gallbladder.—In disease of the gallbladder, most roentgen-ray signs are caused by gross anatomic changes and appear only in the late stages of the disease; while the roentgen-ray report is often negative in the milder, earlier cases before adhesions, thickening of the gallbladder, or stones have developed. In spite of all "gallbladder statistics," the clinical findings are the best guide in a large proportion of cases of gallbladder disease at the present time.

I have always been an enthusiast in roentgen-ray examination of the gallbladder and have watched the development of the technic with the greatest interest, as well as the finding of direct signs (stones, visible gallbladder) and indirect signs (adhesions, pressure deformities in duodenum, stomach or colon, spasm of the antrum). I have watched the positive findings in operations on pathologic gallbladders (not stones only) increase from 5 or 10 per cent. up to 50, 70 or even 90 per cent. with improvement in the technic. It is needless to say that these high positive results are obtained only with the best possible technic, the greatest care, interest, skill, time and expense; they are not found in careless or routine work.

14. Moody, R. O.; Van Nuys, R. G., and Chamberlain, W. E.: Position of Stomach, Liver and Colon: Results of Roentgenologic Study in Six Hundred Healthy Adults, J. A. M. A. **81**: 1924 (Dec. 8) 1923.

In order to evaluate statistics properly, we must distinguish between (*a*) all patients examined and (*b*) all patients operated on. What percentage of pathologic gallbladders are found or missed in all patients examined? No one knows. We have no statistics. What percentage are found in the patients operated on? For stones, the figures are from 10 to 50 per cent., or a little more, depending on the technic, and for pathologic gallbladders from 40 or 50 per cent. up to even 80 or 90 per cent., as I have said, with the most perfect technic and conditions. The common fallacy is unconsciously to apply these high percentages of positive findings to cases of gallbladder disease as a whole and to forget that they apply only to the patients operated on, namely, the latest, most serious, most definite group, with the most positive evidence of all kinds. This is said not to minimize the value of modern gallbladder work, but to evaluate the statistics properly.

The new phenoltetrabromphthalein test, just introduced by Graham and Cole[15] into gallbladder roentgenology, is very interesting. The salt is injected into a vein and is excreted almost entirely into the bile, and helps the gallbladder to cast a shadow on the roentgen-ray plate. I have seen some remarkable results in a few individual cases examined by Drs. Percy Davidson and P. F. Butler at the Boston City Hospital. An invisible gallbladder, or even a nest of stones, becomes clearly defined, and then fades again as the salt reaches the gallbladder and later disappears from it. It is a method of great promise.

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THE RATE OF PROGRESS OF FOOD RESIDUES THROUGH THE BOWEL *

WALTER C. ALVAREZ, M.D.
AND
B. L. FREEDLANDER, M.D.
SAN FRANCISCO

It would seem at first sight as if there could be little justification for another article on the rate of progress of food residues through the bowel, because today almost every physician and layman is satisfied that it takes normally from twenty-four to forty-eight hours. Every roentgenologist knows that most of the barium leaves the body within twenty-four hours, and that only traces can be seen after forty-eight hours. It appears now, however, from the studies that we have made that the giving of a large amount of indigestible material like barium with a small meal of gruel or milk must bring about unusual and abnormal conditions. The added bulk of indigestible residue may act perhaps like a large dose of agar or of liquid petrolatum, and, as is well known, patients who are being examined roentgenographically to find the cause of a severe constipation will not infrequently come back for their twenty-four hour examination with an almost empty colon. In other words, their constipation has been temporarily relieved.

It would seem clear, then, that when we want to study the normal rate of progress, we should choose some material without appreciable bulk which can be mixed intimately with the usual food taken by the subject; which will have little or no influence on the motility of the bowel, and which will lend itself easily to quantitative measurements.

We believe that we have found such a substance in the shape of very small glass beads, fifty of which are given at one time in a gelatin capsule. They are chemically inert; they mix intimately with the food; they can hardly have much influence on intestinal motility, certainly no more than that of the many berry and fig seeds, and bits of skin and fiber that are found so commonly in the stools, and they can easily be counted after the fecal material has been sieved. By giving different colored beads on each of three successive days, we have been able to make three rate determinations on each subject with almost no extra work for ourselves. The beads used are the smallest we have been able to find on the market. Their largest diameter is about 2 mm. They have been taken with either the morning or the evening meal, and after that the stools have been voided into large-mouthed jars and have been brought to the laboratory. There they have been sieved, and the number of beads found in each stool has been charted as a percentage of the number taken. Note has been made also of the form and size of the stools.

The idea of using this method was obtained from an article by Elliott and Barclay-Smith,[1] who studied the distribution of food along the digestive tract by giving such beads to rabbits and then killing them at various intervals. A somewhat similar technic has recently been employed by Burnett,[2] who gave from 30 to 50 c.c. of French millet seeds and noted the time, first, when the seeds appeared, and later when they practically disappeared. These seeds are probably better than carmin or charcoal for the identification of fecal material from one particular meal, but they do not make possible quantitative studies such as we have made with the beads.

Our subjects, for the most part, were avowedly healthy young medical students and interns, all men. In addition, a number of office and hospital patients were studied: some with constipation and some without. The hospital patients were in the surgical wards convalescing from minor operations. There were some women in the second group. We wish to thank the volunteers who faithfully brought their specimens each day throughout what must have been a troublesome week. Completion of this work was delayed for years by the fact that many who took the beads either lost one or more stools or else gave up the experiment too soon.

The work was started in 1913 by one of us (W. C. A.); continued at various times by H. S. Parsons and F. B. Taylor, and finished, in 1924, by one of us (B. L. F.). The results obtained by all four workers have been in entire agreement, which makes us feel all the more confident in publishing views so different from those commonly held by the profession. We have recently been encouraged also by the appearance of the articles by Burnett, some of whose findings and deductions are very similar to ours.

RESULTS OF THE STUDY

As will be seen by glancing at Chart 1, the striking fact that has emerged is that the normal individual with a good digestion and a daily bowel movement does not, in twenty-four hours, pass 100 per cent. or anything

15. Graham, E. A., and Cole, W. H.: Roentgenologic Examination of the Gallbladder, J. A. M. A. **82**: 613 (Feb. 23) 1924. Graham, E. A.; Cole, W. H., and Copher, G. H.: Visualization of the Gallbladder by the Sodium Salt of Tetrabromphenolphthalein, J. A. M. A. **82**: 1777 (May 31) 1924.

* From the George Williams Hooper Foundation for Medical Research and the Department of Medicine, University of California Medical School.

1. Elliott and Barclay-Smith: J. Physiol. **31**: 293, 1904.
2. Burnett, F. L.: Boston M. & S. J. **184**: 371 (Apr. 14); 415 (Apr. 21) 1921; Am. J. Roentgenol. **10**: 599 (Aug.) 1923.

like 100 per cent. of the beads. There were two individuals who passed around 85 per cent. in twenty-four hours, but most of the subjects took four days in which to get rid of 75 per cent., and there were some who passed only from 50 to 60 per cent. in nine days. As

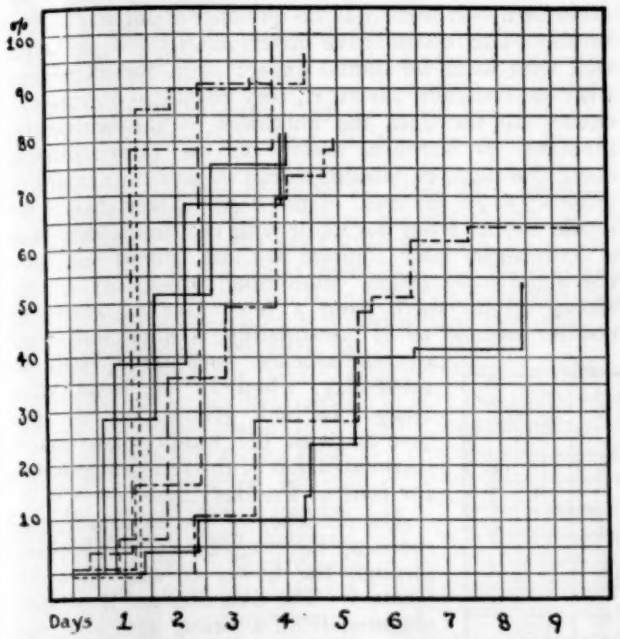

Chart 1.—Wide difference in the rate of passage of beads in eight healthy young men: a fast rate of 85 per cent. in twenty-four hours; an average rate of 75 per cent. in four days, and a slow rate of 60 per cent. in nine days. The abscissas represent days and the ordinates percentages of the number of beads ingested.

Burnett has pointed out, those with the fast, hitherto supposedly normal rates had voluminous, soft, poorly digested and frothy stools. Those with the slower rates had well formed, sometimes ovulated, stools with no gas and fewer food residues. Naturally, those with the slowest rates showed a tendency to constipation.

On taking the averages of the data in the thirty-seven graphs that seemed to fall most closely together in one class midway between the very fast and the very slow, we obtained percentages that plotted out as in Chart 2. There it will be seen that some 15 per cent. of the beads are passed at the end of the first day; 40 per cent. come through on the second; perhaps 15 per cent. on the third, and from 5 to 10 per cent. on the fourth and fifth. Between 90 and 100 per cent. thus come through by the end of the week.

When this work was started, and we failed repeatedly to get more than 90 or 95 per cent. of the beads in the first week, we thought it must be due to the fact that either the subject had failed to bring in all his stools or else that some beads had gone through the sieve; but we found later that there was no need for resorting to this explanation, because when we followed a subject long enough we could generally get back 100 per cent. of the beads. Thus, in one instance, in the case of a constipated person, the stools were sieved carefully until all the beads were accounted for, and the last one came through on the fortieth day. Frequently, also, when we used the same subject over again after an interval of several days or weeks, we would find beads that had been given during the first experiment.

One of the things that has puzzled us most in this study is the fact that the beads given on the second day nearly always come through a little faster than those of the first day; and those given on the third day come through even faster, so that the third line in the graphic record often crosses the second and even the first, as will be seen in Charts 2 and 4. This has occurred so frequently that it can hardly be accidental. The two explanations that we have thought of are, first, that the beads may stimulate peristalsis so that the evacuation of the colon is speeded up; and second, that the first set of beads may be retained to a certain extent in the haustra of the colon, in the appendix, or elsewhere, where the bowel makes a special effort to digest them. The second and third sets might then have to move on without any delay because this space in the bowel would already be taken. In favor of the first explanation was the fact that the stools were sometimes softer and more voluminous toward the end of the experiment, indicating a more rapid progress of all the food residues as well as of the beads. The difficulty remains, however, that the first set of beads does not seem to be influenced by this speeding up process. They apparently get out of the central current and off into the haustra or other folds of the colon. In a few instances, we were able to study the rate of progress of the beads in the same individual on two or more occasions. Ordinarily there was considerable resemblance between the different graphs for the same man, but sometimes there was a good deal of difference.

EXPERIMENTS ON ANIMALS

In order that we might get a better idea of the distribution of the beads along the bowel, we repeated some of the work of Elliott and Barclay-Smith on rabbits. They found that within six hours after ingestion, 10 per cent. had reached the middle colon, i. e., 3 or 4 meters from the mouth; 50 per cent. were still in the stomach; 10 per cent. were in the small intestine, and 30 per cent. were in the cecum and sacculated colon.

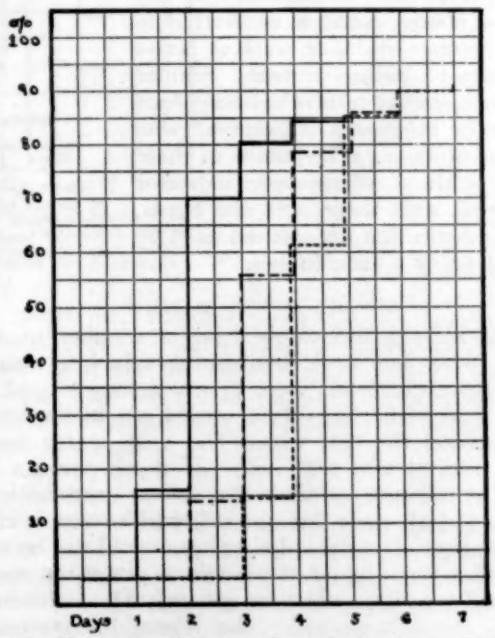

Chart 2.—The most typical rate observed, the figures charted being averages from thirty-seven determinations. The beads given on the second and third day tend to catch up with those given on the first.

They never at any time found many beads in the small bowel. Our results have been very similar. The two places in which beads can usually be found for a week or more are the stomach and the cecum. It is interesting to note that in one rabbit the appendix contained

thirty-four beads, or nearly half of those found in the whole digestive tract. In that appendix there were 26 per cent. of the beads given seventy-seven hours before, 28 per cent. of those given fifty-two hours before, and 14 per cent. of those given twenty-seven hours before. Elliott and Barclay-Smith mention having seen a similar accumulation of beads in the appendixes of some of their rabbits. In three out of four of our rabbits, however, the appendix contained no beads. It would be an interesting experiment to give beads to women several days before they enter the hospital for pelvic operations, so as to see how often and to what degree these foreign bodies stagnate in the human appendix.

In the course of some work on rickets done in this laboratory, Dr. Martha Jones has observed that 5 grains (0.3 gm.) of carmin given to puppies will come through so completely in twenty-four hours that none can be seen macroscopically after that. If 10 grains (0.6 gm.) is given, the puppies develop diarrhea, so that it is very questionable whether carmin is a suitable substance for measuring the normal rate of progress of the food residues.

K. F. Meyer and Jessie Easton will soon report, from this laboratory, extensive studies on the passage of washed, detoxified spores of *B. botulinus* through the digestive tracts of rabbits and guinea-pigs. In all but one instance, these spores seemed to have little or no influence on the animal. Large numbers came through in twenty-four or forty-eight hours; a good many for the next week, and then a few at intervals for months afterward. It is hard to believe that any of these spores could have started to grow, because it takes so few active organisms to kill an animal. Similar work with similar results has been done recently by Holman and Fernish,[3] who used *B. anthracis*. The results of these studies with a microscopic indicator check well with those with the beads, showing again that the method used by us is probably a reliable one.

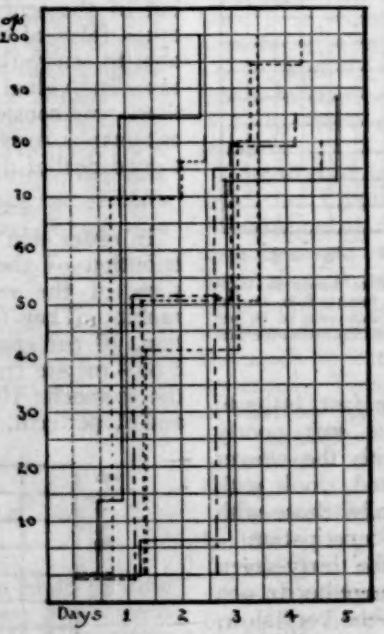

Chart 3.—The slow and the fast type of barium extrusion in seven individuals: Comparison of these curves with those for the beads reveals the tendency to a more massive extrusion of the barium.

STUDIES WITH BARIUM

While sieving the stools from a number of individuals who had been roentgenographed a week or more before the beads were given, it was noticed that a good deal of barium often settled out in the bottom of the vessel through which the wash water flowed. It was noticed also that many of those patients who seemed at the time of their last screen examination to have voided all their barium still had so much in the bowel that satisfactory kidney plates could not be made for another week or ten days. Even purgation seemed often to have little effect in getting rid of this small residue. We felt, therefore, that it would be interesting to study the barium in the stools quantitatively, so as to see what fraction comes through rapidly and what remains for slow extrusion. Accordingly, a number of healthy students were each given 60 gm. of barium in milk, and the stools were collected for five days. Weighed portions were incinerated, and the ash was treated with nitric and hydrochloric acid. This dissolved everything but the barium. In order to be sure that all the barium was being retained, some dilute sulphuric acid was added, and the precipitate was washed, dried and weighed.

Chart 3 shows the results of the analyses in the seven cases in which there was no question about any loss of stools. The quantitative determinations agree quite well with what we should expect from our experience with the roentgen ray; i. e., they reveal two groups of cases. In the first, the bulkiness of the barium or, possibly, its chemical action on the bowel brought about the rapid expulsion, within twenty-four hours, of from 45 to 85 per cent. of the dose. After that, as we would expect from the work with the beads, there was a forty-eight hour interval without stools, in which the abnormally empty colon filled up again. In the second group there were a few cases in which the powder seemed to be constipating, and no movement of consequence took place until the third day, when 75 per cent. came away. In both groups, we see that, just as with the beads, there was a slow extrusion of the remaining barium for four or five days more.

The tendency of the barium meal to speed up the progress of food residues through the bowel is well shown in Chart 4. The data charted there were obtained from a young man who took the usual barium meal with his first set of beads. It is clear that the first set went through much faster than did the second and third. We see also that the stool on the second day was a large one which emptied the colon to such an extent that after that for four days it had to fill up slowly. On the fifth day there was another even larger cleanout, followed, as we would expect, by some "constipation." The stool passed on the eighth day was the first one to be solid; the others were mushy.

In order to make sure that our interpretation of these phenomena was correct, we gave laxatives to some of the subjects after they had taken beads. Next day, from 80 to 90 per cent. of the beads came through, and then, for the next forty-eight hours, there were no bowel movements at all. The textbooks tell us that this constipation after purgation is due to an astringent after-effect of the drug, but the new explanation seems to us to be simpler and more satisfying. Time and again during this study, we have noted that any unusually large defecation or any spontaneous attack of looseness of the bowels which brought away more than the usual number of beads was followed by a period during which the stools were either small or entirely lacking.

CONCLUSIONS

The most interesting fact that emerges from these studies is that the colon normally retains food residues from meals taken during the preceding week or before. Ordinarily, about 80 per cent. of the residue from any one meal is extruded by the end of the fourth day. The rate varies markedly, however, in normal young men who have one or more satisfactory bowel movements every day. The fact that most of the stools are mix-

3. Holman, W. L., and Fernish, C. A.: Am. J. Hyg. 3: 640 (Nov.) 1923.

tures of food residues—some, such as meat and starch, comparatively easy of digestion, and others, such as seeds and skins, very difficult of digestion—suggests that the bowel has little or no ability to pick and choose between those materials which are ready for extrusion and those which might with advantage be held over for further chemical action. Actually, we know that mushy material is constantly flowing into the cecum, where a mixture of new and old must take place. Beyond that region, in men and women with formed stools, there is probably little or no mixing. We have seen stools with such sharp divisions between the residues from two different meals (beans and berries, for instance) that there could be no doubt that, after leaving the ascending colon, those residues had gone the rest of the way to the anus like cars on a track. It is a point of some practical importance that, when the end portion of a formed stool is quite soft, we can say, with a considerable degree of confidence, that the colon has emptied itself as far back as the ascending colon, and we need then have no fear of a masked intestinal stasis.

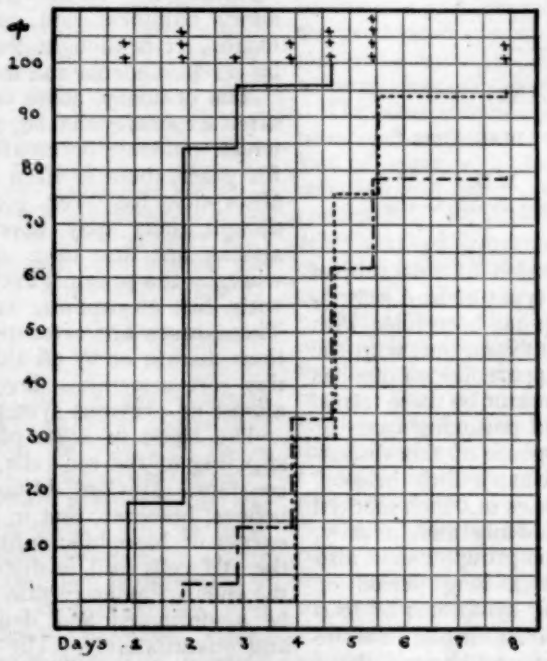

Chart 4.—Faster passage of the first set of beads when 60 gm. of barium is given with them. Comparison should be made with Chart 2. The first six stools were mushy. No barium was visible in the stools after the third day.

But to get back to the problem of the mixture in the cecum. If we had a number of individuals with artificial ani at the hepatic flexure, we could soon, with the help of the beads, say what proportion of the cecal contents is passed onward every twenty-four hours; and the number of beads recovered each day would bear a constant relation to the number of those remaining the day before. If we assume, after the manner of the mathematicians when they are simplifying a problem, that there is neither mixing nor more than twenty-four hours' delay in the colon beyond the hepatic flexure, our averages from those subjects whom we consider to have had the most typical rates of passage suggest that a sixth of the material that arrives from the ileum each day goes right on, together with about half of what is in the cecum. This supposition will account for the figures obtained in the first three days. After that, the extrusion of the beads falls rapidly below what would be predicted from the formula. The trouble, of course, is that there are innumerable variables. In some men and women, the cecum must empty itself almost completely every day, and in others there must be a great deal of stagnation throughout the colon. We know from roentgen-ray studies that in some individuals the cecum empties early, and in others it empties late, after the rest of the colon has been cleared of barium.

The essential point is that wide variations are perfectly compatible with good health. We have carefully questioned the men with the fast rates and those with the very slow ones, and have been unable to draw from them any admission of poor digestion or poor health. Theoretically, we would agree with Burnett that the men with slow rates and well formed, well digested stools should have the good health, and those with the fast rates and voluminous, mushy, badly digested, and frothy stools should have poor nutrition, flatulence and indigestion. In office practice that is often true, but it is not a rule, because some people are so insensitive, or their factors of safety are so great that they remain oblivious to a high degree of intestinal indigestion.

One thing that has impressed us is the frequency with which mushy, unformed stools are encountered in normal young men. We had always had the idea before that the normal stool is formed. Another noteworthy observation is that few of these men were as regular as they thought they were. Possibly temporary changes in diet caused increases in the amount of feces and in the rate of passage and after that there would be the periods of "constipation," during which the colon was filling again.

The valuable lesson that may be learned by the clinician is that, when the colon is well cleaned out by a purge or by a large defecation, no bowel movement should be expected or demanded the next day. It will appear only if the colon is so sensitive that it can respond to the distention brought about by the food residues from one day. In some cases, of course, a chemical irritation may be the more important factor, but, ordinarily, a certain amount of distention seems to be the main stimulant for colonic contraction. If very little food is taken, as after an operation or during an illness, or if the colon is unusually long or large in diameter, the period of normal waiting may be several days or a week or more. To give purgatives during this time is meddlesome and unjustifiable, except in those cases in which the individual or his relatives become sick with anxiety over the dangers of autointoxication, or in those cases in which headaches actually develop. It is questionable, therefore, whether purgatives or laxatives that produce copious movements should ever be given oftener than two or three times a week. Certainly, any one who has been purged and who wishes to get back to normal must expect to wait a day or two for his first normal movement.

SUMMARY

The commonly accepted view that food residues from any one meal are evacuated in the next twenty-four or forty-eight hours is shown to be largely erroneous.

It is seen now that the usual large amount of barium given with a small meal acts like agar or liquid petrolatum and speeds up the progress of material through the bowel.

In the study here reported, fifty small glass beads were used as an index to the rate of progress of the everyday food of the individual. Ordinarily, some 15 per cent. of these beads are passed on the first day; 40 per cent. on the second; 15 per cent. on the third, and 10 per cent. on the fourth day. After that, it

may take days or weeks before the last few beads are recovered.

The rate of progress varies widely in normal persons. No symptoms of disease were found in men and women who took a week or more to pass 70 per cent. of the beads. Fast rates, i. e., 85 per cent. in twenty-four hours, are associated with the passage of soft, badly digested stools.

Purgative drugs or spontaneous attacks of diarrhea empty the colon so thoroughly that often for one or two days afterward there are no bowel movements or else very small ones.

After a barium meal, the quantitative analysis of the stools for that drug shows that, although most of it is extruded in the first twenty-four or forty-eight hours, a considerable amount remains to come away slowly during the next few days.

These observations must modify some of our views about intestinal autointoxication and the need for the frequent use of laxatives.

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LEAD POISONING

ITS SYMPTOMATOLOGY AND DIAGNOSIS *

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The first essential in the discussion of this subject is the classification of the various types of lead poisoning. For a long time the literature has been filled with references to acute or chronic plumbism, but, with the exception of Sir Thomas Oliver, apparently no one has taken the trouble to define what is meant by these terms. Oliver has classed under acute lead poisoning cases of encephalopathy only. For the purposes of this discussion, however, I shall make this class a little broader in scope, so that it will include all cases in which marked symptoms and disability occur suddenly and, usually, after only a brief exposure. In this group, I shall also consider those cases which, after a long period of exposure, suddenly develop striking symptoms of lead intoxication as a result of a sudden impairment of excretory function. I shall classify as chronic those cases developing slowly as the result of various pathologic changes in the body and occurring without the dramatic manifestations so commonly present in acute cases.

The group into which any particular case will fall is determined almost entirely by individual susceptibility to lead. Personal idiosyncrasy is believed to be more striking in lead than in any other metallic poisoning. Some workers will develop an acute attack after working only a few days, while others may work for months at the same employment without harm.

The signs and symptoms of acute lead poisoning are usually referable to either the gastro-intestinal tract or the nervous system, although we sometimes see cases involving both. The intensity of the prodromal symptoms is commonly greater than in the chronic cases. At first, the patient often has a sweetish metallic taste in the mouth, then anorexia, nausea and sometimes vomiting. There may be also severe headaches, insomnia, general asthenia and a feeling of lassitude. These symptoms are frequently followed quickly by diarrhea, due to the gastro-enteritis so often present in acute cases. On the other hand, after a few days of general malaise and constipation, the patient sometimes develops sudden, severe colic. This may occur without warning or be preceded several days by vague, colicky pains. Accompanying this there is frequently pallor of the skin, an increase in blood pressure, and a slow, hard pulse. All these signs are probably due to the same factor, a spasm of smooth muscle causing arterial and intestinal constriction. Usually there is also some albuminuria due to an acute nephritis affecting the cells of the renal tubules.

In the form attacking the nervous system, an acute neuritis often occurs, causing severe pains along the nerves affected and sometimes a distal ataxia. There may be a neuritis of the optic nerve, later resulting in optic atrophy and blindness. In the more severe but, fortunately, comparatively rare cases, the encephalopathies, there is severe headache, delirium, convulsions, vomiting and retinal changes, with diplopia or transitory blindness and sometimes paralysis, coma and death. It is thought that these symptoms are caused by cerebral edema and minute cerebral hemorrhages.

The ordinary, acute case occurs comparatively soon after exposure has begun. In those cases, however, which suddenly occur after a person has been exposed for years, there is often a lead line indicating that lead absorption has been going on for some time, even though there may have been no symptoms. Such attacks are due to a sudden change in metabolism whereby the person's excretion can no longer keep pace with his absorption, and lead intoxication results. These cases are often precipitated by an acute infectious disease or by an alcoholic debauch. A patient of this sort sometimes develops a sudden paralysis with almost no previous symptoms.

The blood in acute plumbism may show basophilic stippling of the red cells, but stippling is by no means constant. McCord, Minister and Rehm [1] of Cincinnati believe, however, that in all cases of lead poisoning an excess of basophilic substance is present in certain of the red cells and is distributed uniformly throughout the cells. Under certain conditions, this substance can be agglutinated and demonstrated, both qualitatively and quantitatively. The presence of this substance is regarded as an evidence of the precocious introduction of red cells into the circulation, such as occurs in anemia. They believe that, while the test is not diagnostic of lead poisoning, it is at least highly significant, and any lead worker showing this basophilic aggregation should be placed on lead eliminating treatment, whether or not he shows clinical signs or symptoms of lead poisoning.

REPORT OF CASES [2]

Three cases studied during a survey of the pottery industry are representative of the types of lead poisoning just described.

CASE 1.—*Mild, acute plumbism attacking the gastro-intestinal tract in a man markedly susceptible to the effects of lead.* A man, aged 24, a workers' manager in a pottery, who, as such, did not come in close contact with lead, during the absence of a saggar washer painted saggars with a solution of red lead. He quickly developed severe diarrhea, anorexia, nausea, headache, dull abdominal pain, albuminuria and marked lassitude. Examination of the blood was negative. The symptoms

* Read before the joint meeting of the Section on Pharmacology and Therapeutics and the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. McCord, C. P.; Minster, Dorothy K., and Rehm, Mathilde: The Basophilic Aggregation Test in Lead Poisoning, J. A. M. A. **82**: 1759 (May 31) 1924.

2. Several of the cases reported in this paper were also reported by the author in a previous paper (Industrial Lead Poisoning, J. A. M. A. **76**: 835-842 [March 26] 1921).

cleared up soon after he stopped this work, but began three days after its resumption, necessitating that he discontinue work of this kind altogether.

CASE 2.—*Acute form, with early paralysis, which sometimes occurs almost without warning.* A man, aged 57, had dipped in a pottery for twenty-six years without signs or symptoms of lead intoxication. He had then farmed for three years, at the end of which time he again began dipping. In a few days he began to have pains in the right foot and ankle and along the course of the peroneal nerve. In addition, he had a metallic taste, nausea, and tremors of the tongue and the fingers. One week later, he suddenly developed peroneal paralysis of the right leg, with foot-drop. He discontinued work for four months, during which time he gradually regained strength in the peroneal muscles and power of dorsiflexion of his foot and toes. The neuritic pains gradually disappeared.

CASE 3.—*Acute lead encephalopathy, occurring in a patient who had been exposed to lead for some time, but whose excretion could, under ordinary circumstances, keep pace with the lead absorption. When this balance became disturbed, lead intoxication resulted.* A man, aged 42, had worked as a glost kiln placer in a pottery for six years without any signs or symptoms of lead intoxication. He had a lead line, however, which indicated a certain amount of lead absorption. Suddenly, he developed rather marked pallor, weakness of the muscles of the arm associated with general asthenia, tremors of the tongue and the fingers, and increased nervous excitability. About two weeks after the onset of these symptoms, he suddenly lost consciousness and was unconscious for about an hour. This was followed by severe headache, ptosis of the right upper eyelid, and diplopia. The blood pressure was: systolic, 160; diastolic, 100. The Wassermann reaction and venereal history were negative. The hemoglobin was 88 per cent., the red count 4,200,000, and there was no basophilic stippling. Almost complete recovery resulted after six months' treatment and the patient returned to his work.

Chronic lead poisoning, rather than acute, occurs in those persons who have either superior eliminative powers or an increased tolerance for lead. In these, the long continued absorption of lead causes a more or less generalized fibrosis, which eventually affects practically all the organs of the body. Just as these pathologic changes occur gradually, so do most of the symptoms come on insidiously, and may be referable to almost any organ in the body. In many cases, it is possible to detect signs of lead absorption before symptoms of intoxication are present and to forestall the latter by taking measures to prevent any further lead absorption and to eliminate that which has already occurred.

SIGNS

The most common and easily detected sign of lead absorption is the lead line in the gums. It is caused by a deposit of lead sulphid in the cells of the deeper layers of the gums, and, if bismuth is excluded, is positive evidence that lead is, or has been, present in the blood stream. This line occurs as a fine stippling near the gum margin and may be readily demonstrated by inserting a flat, white toothpick between the gum and the tooth. This sign is more likely to be present among those lead workers who have bad teeth and diseased gums, but I have found it present many times when both teeth and gums were healthy.

A large number of lead poisoning patients, however, do not exhibit a lead line, but in most of these the presence of lead may be detected in the urine. It is possible that lead absorption may exist without the appearance of lead in the urine, provided the amount is small enough to be stored away completely in the tissues. The presence of lead in the feces does not necessarily prove absorption, for the lead may be ingested in an insoluble form and may pass through inertly.

As the lead line is absent in a large number of cases and the detection of lead in the excretions involves a technic often too difficult for general practice, it becomes necessary to rely on certain other symptoms to herald approaching intoxication. Many of these symptoms would be considered negligible in an ordinary individual, but become significant in one exposed to the lead hazard.

SYMPTOMS

The symptoms of chronic lead poisoning may be roughly grouped under three main heads, referable to the gastro-intestinal tract, the neuromuscular system and the circulatory system. In any given case, one of these groups usually predominates, although symptoms from the other groups also may be present.

In the following discussion, in each group signs and symptoms are listed in the ascending order of their occurrence and increasing severity. In almost all cases the prodromal symptoms are general malaise and asthenia, often accompanied by insomnia, dizziness, general lethargy, loss of weight, and headaches.

The most common symptoms referable to the gastro-intestinal tract are a sweetish, metallic taste, nausea, loss of appetite, abdominal pains and tenderness, constipation and colic. A metallic taste and an ill defined nausea may be present for a long time without any other marked symptoms. On the other hand, they may come on rather suddenly and presage more severe developments. They are also probably responsible, in some degree at least, for anorexia. The loss of appetite is noticed first for breakfast only, but later becomes more marked, so that there is scarcely any appetite for any meal. This is an important symptom, for if a lead worker eats no breakfast, he will absorb ingested lead much more quickly because of the greater acidity present in his stomach, and intoxication will therefore occur more promptly.

There may be mild, fleeting, generalized abdominal pains and tenderness, often associated with constipation or constipation alternating with diarrhea, for a number of months without the occurrence of anything more dramatic. Again, these pains may be the warning that an attack of lead colic is impending. In the latter case, the constipation becomes much more obstinate and the bowels can be opened only with great difficulty. The abdominal pain increases in intensity, localizes around the umbilicus, and assumes a rhythmic, colicky nature. Sometimes the colic occurs suddenly, without previous warning, and the pain becomes so severe that large doses of morphin may fail to relieve it entirely. Along with the colic there is a contraction of the abdominal muscles, so that the abdomen becomes somewhat scaphoid and hard to the touch. There may also be nausea and vomiting, and the expression is fixed and drawn. During the attack there is an increase in blood pressure and a slowing of the pulse, together with an increase in the pallor of the skin and mucous membranes and a decrease in the urinary output. The colic may pass away in the course of several hours or may last for several days. Sometimes, following an attack, vague abdominal pains and tenderness may be present for a number of days.

One of the most common symptoms referable to the nervous system is headache, which is usually frontal in type and comes on gradually over a long period of time, so that the patient is unable to state just when it began. In some patients, it becomes almost continuous

and is very severe. In many cases there is a somewhat similar development of muscular and joint pains, and "lead rheumatism" and "poor man's gout" are frequent complaints. It is likely that these symptoms are the result of scattered patches of neuritis. The same pathologic condition is also responsible for the gradual development of the extremely common tremors of the fingers in the affected limb. Tremors of the tongue, eyelids and lips are very common in old cases, and are probably central in origin. As intoxication increases, muscular fibrillation is sometimes seen, and incoordination occurs.

As the neuritis progresses, a distal ataxia appears, and there is difficulty in executing the finer movements of the fingers; parenthesias develop, followed by gradual muscular weakness and, sometimes, by atrophy. These are present first, and to a greater degree, in those muscles which are used most. In one who works a great deal with his hands, the grip becomes weaker and there is a lessening of the power of dorsiflexion. In a number of cases, I have seen these signs associated with moderate local edema. Often, these signs are a warning of approaching palsy; in other cases, paralysis occurs suddenly without previous local disturbances.

There are a number of different types of lead palsy, but the most common is the antebrachial type, which causes wrist drop. Other forms are the brachial, which affects the muscles of the shoulder girdle, the Aran-Duchenne, which affects the small muscles of the hand, and the peroneal type, which affects the peroneal muscles and the extensors of the toes. In rare cases there is a generalized paralysis, which may involve the diaphragm and cause death. After paralysis occurs, the paresthesias, neuritic pains and other symptoms that have heralded its approach usually disappear. Occasionally, a moderate local edema persists for some time.

Some patients develop mental symptoms somewhat like those of general paralysis. There is first general nervousness and instability, followed by periods of depression or melancholia, and the memory becomes defective. The speech is tremulous, slowed and interrupted, and the gait uneven and uncertain. The pupils are often unequal, and hippus is present. Sometimes there may be hallucinations or even transient delirium. The knee jerks may be diminished or absent.

The most common symptoms referable to the cardiovascular system are pallor, anemia, changes in the blood cells, arteriosclerosis, an increased blood pressure and moderate cardiac hypertrophy.

Pallor of the skin and mucous membranes is an early and prominent symptom, and is seen in practically all cases. This condition is only partly due to anemia, however, for it is often present before anemia develops, and is probably due mainly to a constriction of the peripheral arterioles. The degree of anemia varies markedly in different cases. In perhaps the majority of cases, it is only slight, even when intoxication is severe. In other cases, anemia may be quite marked, but, as a rule, the red count seldom falls below 4,000,000. It is of the secondary type, and structural changes in the red cells are not marked. While it is true that basophilic stippling sometimes occurs, it does not appear with the frequency with which it was formerly credited, at least in chronic cases. The presence of a moderate degree of mononucleosis is practically constant. The hemoglobin usually ranges between 65 and 90 per cent.

In patients who have been absorbing lead for some time, there gradually develops an arteriosclerosis. As this progresses, an arteriosclerotic type of chronic nephritis occurs. These factors combine to produce a moderate increase in blood pressure, and a moderate cardiac hypertrophy. In some cases, probably as a result of sclerosis of the valves of the heart, there develops slight valvular incompetence.

In addition to these three main groups of symptoms, there are certain other disturbances worthy of mention. Parotitis and oophoritis are encountered occasionally, and, rarely, a care of orchitis. Among women, irregularities of menstruation are common, and abortions are frequent in those exposed to the lead hazard.

The following case reports are illustrative of some of the symptom complexes just noted:

Case 4.—A man, aged 37, a dipper in a pottery for fifteen years, addicted to the use of alcohol, had marked pallor for years. Finally, he began to notice weakness in the thumbs, which became progressively worse and gradually affected both hands and wrists. Four months after the appearance of the first signs of muscular weakness, his wrists suddenly "gave way" at his work and complete bilateral wrist drop followed. At this time, examination revealed marked pallor, bilateral wrist drop, with antebrachial and scapulohumeral atrophy; moderate edema of the hands, fingers and feet; marked tremor of the fingers, tongue, lips and eyelids; local muscular fibrillation; distal ataxia; mitral insufficiency, and decreased reflexes. The blood pressure was 135 systolic and 85 diastolic; the red count was 5,200,000. There was no structural change in the red cells and no basophilic stippling; 24 per cent. of the white cells were large mononuclears; the hemoglobin was 95 per cent.

This case is one in which the neuromuscular group of signs and symptoms predominates, with scarcely any symptoms from either of the other groups. It is rather rare to have such a complete absence of gastro-intestinal symptoms, even of constipation, as there is in this case. It also illustrates the importance to be attached to premonitory signs of weakness in the muscle groups that are most used; in this case this was the only sign of approaching paralysis. It also should be noted that marked pallor was present without anemia.

In Case 5, many symptoms are present from both the gastro-intestinal and the neuromuscular groups, and there was also a very mild secondary anemia. The amount of pallor present was much greater than that which would be caused by anemia alone.

Case 5.—A man, aged 45, a dipper in a pottery for eighteen years, a moderate user of alcohol, complained of general asthenia and malaise; frequent severe frontal headache; morning nausea; pronounced anorexia, with a metallic taste; vague abdominal pains and tenderness; very obstinate, constant constipation; neuritic pains in the arm, hands and shoulders; sore muscles; painful joints; lumbago; numbness and tingling in the hands and fingers; alternating periods of depression and excitability; failing sight; insomnia; dizziness; lethargy, and loss of weight. Examination revealed marked pallor of the skin and mucous membranes, with poor nutrition and a generally unhealthy appearance. There was local emaciation of the hands, wrists and forearms; arcus senilis; sluggish pupillary reactions and hippus; spongy, cyanotic gums; teeth worn but sound; a marked lead line; tremors of the tongue, the fingers and the labial muscles; tremulous voice; impaired power of dorsiflexion of the wrists, especially on the right; enlarged joints, and hyperactive reflexes. The blood pressure was 140 systolic and 80 diastolic. The hemoglobin was 65 per cent.; the red count was 4,600,000, with the central pale areas increased; 16 per cent. of the white cells were large mononuclears. There was no basophilic stippling.

Case 6 illustrates the selective action of lead on the generative system.

Case 6.—A woman, aged 36, had worked as a dipper's helper in a pottery for about eighteen months, when she complained

of anorexia; metallic taste; constant headaches; abdominal pains and tenderness; frequent attacks of colic; constant, obstinate constipation; numbness; tingling and pains in the hand and arm; muscular soreness and pains in the joints, and fits of depression without apparent cause. Since she had been exposed to the lead hazard, she had had dysmenorrhea and menorrhagia and one abortion. Examination revealed pallor; an unhealthy appearance; poor teeth; spongy gums; a lead line, and a weakened grip. The Wassermann reaction was negative. The blood pressure was 138 systolic and 86 diastolic; the hemoglobin was 80 per cent. The red count was 4,300,000; the large mononuclears were 18 per cent.

An interesting case of lead orchitis has recently been reported by McCord and Minster.[3]

The diagnosis of a well marked case of lead poisoning is by no means difficult. Possibly the greatest aid in diagnosis is a history of exposure. This being known, every patient presenting himself with obscure symptoms referable to either the gastro-intestinal tract or the nervous system should be considered as having lead poisoning until the contrary is proved. Evidences of lead absorption, such as the lead line, while not in themselves evidence of intoxication, are at least highly significant, and all cases showing such signs should be considered at least potential cases of lead poisoning.

As the pathologic condition incident to long continued absorption of lead is present in so many organs of the body, affecting as it does the circulatory, the digestive, the nervous and the excretory systems, together with some of the organs of special sense, it follows that many of the signs and symptoms of lead poisoning are present also in many other diseases.

Lead colic may occasionally be confused with appendicitis, cholelithiasis, intestinal obstruction, etc. In lead colic, however, the temperature is not increased, the pulse is slow, and leukocytosis is absent. The centralization of the pain in the region of the umbilicus is also different from that in appendicitis or gallstone colic. In intestinal obstruction, the pulse becomes weak and rapid; the abdomen becomes markedly distended, and the vomiting soon becomes fecal in character.

In neuritis and paralysis due to alcohol or arsenic, there is usually a greater prominence of sensory symptoms and other evidence of the action of these poisons, and the common signs and symptoms of lead poisoning are absent. The history is of especial value in these cases.

In the case of lead encephalopathy, it is sometimes necessary to differentiate epidemic (lethargic) encephalitis, cerebral hemorrhage and brain tumor. In these, also, the history is of extreme importance. The presence of lead in the urine will generally clinch the diagnosis, and punctate basophilia of the red cells is sometimes of value. In these cases, which are usually acute, Liebermann's blood corpuscle resistance test is positive.

In an occasional chronic case affecting the nervous system, it becomes necessary to rule out general paralysis. In such cases, however, the exaltation of ideas, delusions of grandeur and uncertain temper encountered in general paralysis are absent, and examination of the spinal fluid is negative.

SUMMARY

Lead poisoning is a disease in which personal idiosyncrasy varies exceedingly, and the type and the severity of the intoxication are controlled more by individual susceptibility than by the amount of lead absorbed.

Acute lead poisoning is characterized by sudden marked symptoms and disability, usually occurring after only brief exposure. The symptoms in this type are referable either to the gastro-intestinal tract or to the nervous system. Cases of lead encephalopathy are classed in the latter group.

Chronic lead poisoning develops slowly as the result of gradual pathologic changes incident to long continued lead absorption, and is without sudden signal manifestations. The symptoms in this type are referable to the gastro-intestinal, the neuromuscular and the circulatory systems. In many of the cases in this group, there have been present for some time the signs of lead absorption: a lead line or the presence of lead in the urine or feces.

As this is a preventable disease, and recovery usually follows the removal of the cause, it is highly important that the diagnosis be made early. The greatest aid in diagnosis is a history of exposure. Any patient, exposed to lead hazard, who presents himself with vague symptoms referable to the gastro-intestinal tract or to the nervous system, should be considered as having lead poisoning until a definite reason appears for considering otherwise. Valuable time should not be lost in waiting for objective signs to appear, when suggestive symptoms are present. The most careful scrutiny should be given to such symptoms as loss of appetite, headaches, muscular weakness, lassitude, insomnia, constipation, abdominal tenderness, pain in the muscles, joints and along the course of the nerves, paresthesias and general nervousness, because they may be the warning signals of approaching severe gastro-intestinal manifestations and lesions of the nervous, circulatory and excretory systems.

1041 Lakeside Avenue.

3. McCord, C. P., and Minster, Dorothy K.: Lead Arthritis, J. A. M. A. 82: 1104 (April 5) 1924.

THE PREVALENCE AND DISTRIBUTION OF INDUSTRIAL LEAD POISONING *

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It is just about fourteen years since I made my first voyage of exploration into the lead trades, as a member of a commission appointed by Governor Deneen to study occupational poisoning in the state of Illinois. Fourteen years is not very long, but in that time many changes can come, and in American industry many have come. In 1910 there was no workmen's compensation law, and the damages paid to injured employees were for accidental injuries, not for illness. No employer was held responsible for lead poisoning in his working force, and, in consequence, few of them knew there was such a thing, and the physicians who did know kept the knowledge to themselves. In 1910, the American Medical Association had never held a formal session on the subject of occupational diseases. That happy state of ignorance has vanished; there is fairly general information as to lead poisoning in industry and very creditable efforts have been made to protect workers against it.

We are still, however, far behind the older industrial countries in the accuracy of our knowledge of this and other trade diseases, because we lack the system of sickness insurance which in England and on the conti-

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nent so quickly reveals any unusual source of trouble and which makes it possible to keep tab on a lead trade and check up on the measures of prevention. We lack also expert factory inspectors and impartial experienced government medical examiners to pass on a questionable diagnosis and to deal with a puzzling situation. Any one who has tried knows how almost impossibly difficult it is to get exact data about the incidence of lead poisoning in any one trade in this country, and, therefore, when I compare the present with fourteen years ago, I am really comparing factory conditions in the two periods and reasoning that, if lead dust and fumes have been lessened or if less lead is used, there must be less lead poisoning.

Conditions in all the lead industries have improved in fourteen years, and yet it is true now, as it was in 1910, that while the best American factories usually measure up with the best foreign ones and may even surpass them, the worst are far below what is tolerated in such countries as Germany or England or Holland. For instance, the white lead industry in the United States has undergone an enormous improvement during the last twelve years, and yet I recently visited a large plant which is still using the old methods, with many of the old familiar dangers, a plant which could not be operated in those countries.

USES OF LEAD

The use of lead in industry begins, of course, with mining. Here we have an unusual situation, for, while the older countries have for many years been handling only sulphid ore, because old mines are deep, Americans and Australians are still mining oxidized ores, chiefly carbonate and sulphate, compounds which are much more soluble in human gastric juice than the sulphid. Missouri lead mines are down below the water line now, but in the far western mines oxidized ore is still to be found, and, when the mine is dry and dusty, lead poisoning is not at all uncommon. Indeed, information gathered by A. L. Murray for the Bureau of Mines, in 1921, showed a surprising prevalence of plumbism among Utah lead miners.[1] Dr. Murray secured reports of 595 cases of plumbism in Utah in 1919 and 1920. Some of these came from the great smelters at Midvale, Murray and Tooele; but 468, or 76 per cent., were from the mines. These figures mean rates for the whole population of the state equal to 8.3 and 5.0 per 10,000, an amazing thing when one considers that it is primarily an agricultural and stock-raising community.

There is very little plumbism in Bingham, the largest center, because the mines are damp and older and the oxidized ores are exhausted. The highest incidence is in Frisco, where the mines are dustier than anywhere else, and there is more carbonate ore. Here, in 1919, 16.8 per cent. of the men were poisoned, and in 1920, 27 per cent. The rate for the mining industry in the whole state was 6.7 per cent. in 1919 and 5 per cent. in 1920.

Sampling and smelting the ore and refining the lead follow next. Probably there is a higher rate of lead poisoning among smelter men and refiners than in any other trade. In 1913 there were at least 1,770 cases in nineteen plants employing some 7,500 men, and among these were forty-one encephalopathies, thirty-five cases of paralysis, and sixteen deaths. The greatest danger lies in the fumes of lead oxid and sulphate from the furnaces, fumes being simply oxidized compounds in a state of extremely fine subdivision. Next to that comes the fine dust from the flues and baghouse. We still employ, in some large smelters, the most dangerous method of lead recovery, smelting on the Scotch hearth, and the same process is used in the production of great quantities of sublimed basic sulphate, known as sublimed white lead and blue lead, used in paint and in rubber. There is inevitably a great production of lead fumes and a very unusual amount of lead dust in this form of smelting, but the process has not been abandoned as yet. The smelters that I have been able to revisit fairly recently have installed many improvements and there is certainly less danger now in this branch of lead work than there was ten years ago.

Zinc smelting may carry with it a danger of lead poisoning, for the sulphids of lead and zinc commonly occur together; and, although an effort is made to separate them into a galena concentrate, which goes to the lead smelter, and a blende concentrate, which goes to the zinc smelter, in practice the blende almost always contains lead. Colorado blende concentrate averages from 4 to 6 per cent. lead, and I have found plumbism a fairly common thing among the employees of a large zinc company in that state. On the other hand, Missouri concentrate, such as is worked up in La Salle County, Ill., contains only 0.5 per cent., and New Jersey concentrate, produced by a special process, has still less.

Roasting lead in the presence of air to form the oxids (red lead, orange mineral, litharge) involves danger from fumes at the furnaces, very much lessened of late years by the introduction of mechanical feeding, rabbling and discharging; and the danger of dust in transporting the oxids, dumping, grinding, screening and packing. The dust problem is much harder to solve than the problem of fume control; and, although I have seen oxid plants that were literally dust-free, there are more in which exposure to air-borne plumbism is constant and quite serious. The newer methods of roasting require fewer men, but the number of oxid men, nevertheless, is decidedly on the increase, because of the constantly growing demand for litharge and red lead in making storage batteries, enamels for sanitary ware, in rubber manufacture, and in making glass and varnish, to mention only the most important uses. Lead poisoning in oxid men is likely to be of relatively rapid development and fairly severe.

White lead is made by two methods, the old Dutch process, slow and requiring much hand work, and the Carter, dusty, but quick and largely mechanical. Fortunately, it is the latter that is increasing most rapidly, and another improvement in this industry is the gradual replacement of dry white lead, ground in oil, by pulp lead, which is made by grinding wet lead with oil till the water has been driven out by the oil, and dangerously dusty work avoided. Most white lead works are now equipped with excellent exhausts, automatic dumping, enclosed dry pans and chasers, and many other devices for the protection of the men. Ample washing facilities are universally provided and there is always a physician in connection with the plant. Cases of acute plumbism in white lead men are fairly infrequent now, yet every now and then a serious case, perhaps an encephalopathy, finds its way into a hospital, showing that a susceptible workman still faces a risk when he takes employment in such work. It is the almost universal experience that negroes employed in white lead sicken more rapidly than white men and are far more liable to the brain form of plumbism.

Legge, chief medical inspector of factories in Great Britain, says that the lead industry which, at present,

1. Relation of Lead Poisoning in Utah to Mining, Report of Investigation, Bureau of Mines, August, 1921.

is responsible for the largest number of cases of plumbism, is no longer white lead or pottery glazing, but the making of storage batteries, electric accumulators as the English call them.[2] Making plates for storage batteries involves handling litharge and red lead, and, if old batteries are repaired, the brown peroxid also. It is admittedly a very dangerous trade, and it has the disadvantage of requiring little skill, so that the working force is likely to be very shifting. I made two visits, less than a year apart, to one of the largest plants and found that during the interval the whole force in the pasting room had changed, and where there had been only Russian Jews there were now only southern Slavs. This is always a bad feature. It is impossible to have real shop discipline in so shifting a body of workers, and it is too much to expect that a foreman will take much interest in a gang of men he knows will be gone in a month or so.

There were six large storage battery works in 1914, when I studied the trade for the government; there are seven now. I have been able to revisit five, and of these two are vastly better, two are decidedly improved, and one is a little less bad. But the number of men exposed to the hazard—and not one plant is free from hazard—is much greater than ever before and promises to keep on increasing because of the increase of automobiles and the enormous new demand for batteries for radio equipment. This is certainly one of the most important sources of industrial plumbism.

Enamels for bathtubs, sinks and other plumbing goods constitute one of the chief uses for lead oxids, especially red lead, and here also the number of men exposed is greater than ever before, for we are said to have produced no less than 700,000 new bathtubs last year. These enamels used to contain from 0.5 to 20.0 per cent. of soluble lead,[3] according to the flexibility needed, for lead renders the enamel more fusible. The finely ground dry enamel is scattered over the red hot tub and the enameler must work in an atmosphere foggy with the dust. However, efforts to lessen the danger have been made of late, and it is highly probable that plumbism is not so prevalent in this industry as it was in 1914, when fifty-four out of 148 men whom I examined had unmistakable signs of chronic lead poisoning.

The glazing and decorating of pottery is an industry that has increased a good deal of late years and which seems to improve very little, so far as the control of lead poisoning goes. Twelve years ago I studied the pottery industry in New Jersey, Pennsylvania, Ohio and West Virginia, and when, in 1921, I read the report of a recent investigation made by the U. S. Public Health Service I could discover little improvement in the conditions which had seemed so deplorable in 1912. The physicians of the Public Health Service examined 1,809 men and women engaged in work with lead glaze and found a rate of plumbism equal to 13.5 per hundred, while the rate in British potteries in 1913 was just one fifteenth of that, 0.9 per hundred. It is easy to account for this difference, for our potteries use large quantities of white lead glaze and use it carelessly, and the pottery manufacturers in these states do not hold themselves responsible for the health of their employees. British factory regulations are so framed as to offer every inducement to the manufacturer to use as little lead as possible, for if his glaze contains more than 5 per cent. soluble lead, he must submit to all sorts of onerous and expensive rules.

An industry that is using less lead relatively, but more absolutely, is the manufacture of rubber goods. Lead, usually litharge, sometimes sublimed lead sulphate, is added to crude rubber to accelerate vulcanization and to make the product heavier. Lately, organic accelerators, such as thiocarbonilid and hexamethylenamin, have been taking the place of lead, and yet, so great is the increase of rubber manufacture that there is actually more lead sold to rubber factories than ever before. The handling of the lead is carried on in only two small departments, weighing the compounds and mixing them with crude rubber on heated, open mills. Dust is the danger in both places. A factory employing 2,000 hands may have only twenty-five or thirty men in these two departments, and yet among these men there may be a high rate of poisoning, and the form may be very severe.

LEAD IN PAINT

The painters' trade is still the most important of the lead trades, and it is the great stumbling block to the sanitarian in every country, for it is the one that shows the least progress toward the lessening of plumbism. That is the reason for the movement, sponsored by France, for the abolition of lead paint. The French argue that it is not possible to control the conditions under which the painter works, now indoors, now outside, now for one contractor, now for another; that he cannot be given proper washing facilities in new buildings nor regular medical supervision. Therefore, just as they led the way in abolishing the use of white phosphorus in making matches, so they now refuse to take halfway measures with regard to lead paint, and white lead is no longer made in France and white lead paint is not supposed to be used. The British and the Germans have followed their usual method of trying to minimize the risks rather than revolutionize the industry. German regulations go far. Employers must provide washable working clothes and caps for their painters, facilities for washing, soap, towels and nail brushes, lunch rooms, and medical examination at least once in six months. Dry sandpapering of lead paint is forbidden. These rules apply also to contractors employing house painters. The prohibition of dry rubbing is found also in the laws of Austria, Switzerland and Belgium. Fortunately, the American tendency toward speeding up the job, which is greater each year in our rapid country, is leading largely to the abandonment of sandpapering, except on very high-class interior decoration, on Ford cars, and on vehicle wheels.

The general impression obtains that less lead is used in paint nowadays than formerly, but interviews with white lead producers do not confirm this. Certainly, there has been an increased production of white lead since the war, and the painting trade is still the largest consumer, with potteries coming next. The danger to the painter has been greatly increased recently by the very general adoption of the "spray-gun" for painting all sorts of factory goods, not only small objects which may be placed in a cabinet with an exhaust, but furniture, automobiles, wagons, railway and trolley cars, agricultural machinery, and, more recently, the interiors of buildings. The careful experiments of Sharpe of Toronto have shown that in such work the lead content of the air may go far beyond safety limits and that the ordinary respiratory lets a dangerous amount pass

2. Legge: Annual Report of Chief Inspector of Factories and Workshops, 1921.

3. We used the so-called Thorpe test, by which the enamel is digested for two hours with 0.2 per cent. hydrochloric acid, under continual agitation, and then the amount of lead that has passed into solution estimated. This is the test applied to all lead mixtures used in industry in England, and the rules regulating the trade are more or less strict according to whether more or less than 5 per cent. of soluble lead is present in the mixture.

through. Experiments by the Bureau of Mines show that it is possible to construct a gas mask which will filter out the oily droplets without becoming clogged, but it remains to be seen whether men will consent to work eight hours in a gas mask day after day. My guess is that the advice to do so will be treated as a "counsel of perfection," as the theologians say.

Many examinations of groups of painters have been made of late years to determine the extent of plumbism among them, the results varying somewhat, of course, according to the standard for diagnosis adopted by the investigator. Hayhurst,[4] in 1913, found indications of chronic plumbism in fifty-nine of 100 Chicago painters. Harris,[5] in 1918, examined 402 painters in New York City and found 143, or 35.5 per cent., with definite, clinical plumbism. Sharpe [6] of Toronto, in 1923, examined 132 men, none of whom he was willing to declare to be suffering from plumbism at the time, but thirteen had a history of attacks of lead poisoning. The record of physical defects and symptoms that Sharpe gives is very suggestive of chronic plumbism, tremors, pallor, myalgia, constipation, headache, indigestion and abnormally high blood pressure.

White lead is not, of course, the only lead compound used in paint. There is also lead chromate, sublimed white lead and sublimed blue lead, which are basic sulphates, and red lead and orange mineral, which are mixtures of oxids; but none of these are as soluble in human gastric juice as the basic carbonate, usually known as white lead. The last is also a constituent of glaziers' putty, and only the other day I was told of four glaziers, working in a New York shop, who were found to be excreting lead in the urine. Out of seven samples of glaziers' putty that were analyzed, six contained lead.

THE PRINTERS' HAZARD

The printers' trade is different in several ways from the usual lead trades. The absorption of lead is almost infinitesimal, but it is constant and keeps up for years, because printing is a skilled trade, and a man does not usually quit it unless he must. This is an occupation that has undergone a vast improvement during the last two decades, and the improvement is largely the work of the International Typographical Union. Lead poisoning, recognized as such, has never been common in this trade, but what Naegeli [7] called "metasaturnism," lead cachexia, chronic interstitial nephritis, and arteriosclerosis, are not uncommon. In fact, statistics gathered by the union show that there is an excess of early deaths from heart disease, chronic nephritis, apoplexy and paralysis among printers. Thus, while among white males in the registration area, only 18.6 per cent. of the deaths from heart disease occurred at an earlier age than 45 years, 26.0 per cent. of the deaths in printers came under that age. Apoplexy and paralysis show an even greater contrast, only 9.1 per cent. of the deaths from these causes occurring under 45 years of age in the general population, but 20.4 per cent. among printers.

Tuberculosis, which is really the occupational disease of the printer, has long been linked up with the lead in his occupation, because in every country it has been found that when lead fumes and dust were done away with, the tuberculosis rate always fell. This has been for long a very puzzling problem. Why should pulmonary tuberculosis be so prevalent among men who are exposed to tiny quantities of lead, and that of a relatively nontoxic character, metallic lead, while those who are exposed to much greater quantities and more toxic forms do not have nearly so high a rate? The statistics of the great industrial insurance companies show that printers have a higher tuberculosis rate and die at an earlier age than men who work with soluble lead compounds. This is true also of plumbers and gas fitters, who work with metallic lead.

One of the lead studies carried on recently at Harvard throws light on this hitherto obscure spot. Experiments were made by Fine,[8] in Wallace Fenn's laboratory, using the technic worked out by Fenn for determining the rate of phagocytosis of carbon particles and of silica particles. Fine used metallic lead dust and white lead dust, as well as carbon and silica, and he discovered two facts of great significance in their bearing on the printers' trade. In the first place, metallic lead dust is ingested by phagocytes far more slowly than carbon particles and even than silica, more slowly also than white lead. In the second place, metallic lead under the influence of air and moisture is in part changed to the basic carbonate, and phagocytes that have been exposed to this compound are less able to take up particles of any kind. It seems, therefore, that metallic lead particles in the lung must act much as do silica particles, setting up a fibrotic process, which paves the way for a tuberculosis just as does the silicosis of granite and flint workers.

ADDITIONAL OCCUPATIONS

It is impossible even to enumerate the occupations into which lead enters. I must confine myself to a few which are not usually associated with lead in the minds of physicians and which carry with them a decided danger of lead poisoning. The glass industry is one of the largest users of lead, but it is not the blowers who are exposed; it is the mixers and the grinders. Varnish contains litharge, but here, too, it is not the user but the maker who is exposed. A few years ago commercial artists or engravers, in mechanical retouching, used white lead paint and put their brushes in their mouths and also used white lead paint in a fine air spray. So far as I know, they still do this. We found fifteen cases of serious poisoning among these men and women, back in the days of the Illinois survey, and they and their physicians thought they were suffering either from appendicitis or from a peculiar form of zinc poisoning, because they did not know they were using lead paint. Another very common source of plumbism, which is not generally known, is the brass industry. Cheap brass and brass which needs much molding always contains lead, sometimes as much as 9 per cent. Brass polishers frequently get lead poisoning, which is not recognized as such because this is not supposed to be a lead industry and the unusually severe cases of brass founders' ague or cases of supposed brass poisoning among polishers will almost always prove to be pure lead poisoning or lead and zinc mixed.

EMPLOYMENT OF SEXES

The employment of women and boys in dangerous lead work is forbidden in Europe. We have no such legislation, so far as I know, in any state, but it is not

4. Hayhurst, E. R.: Hygiene of the Painters' Trade, Bull. 120, U. S. Bureau of Labor Statistics, 1913.
5. Harris, L. I.: A Clinical Study of the Frequency of Lead, Turpentine, and Benzin Poisoning in Four Hundred Painters, Arch. Int. Med. 22: 129 (Aug.) 1918.
6. Sharpe, N. C.: Pub. Health J., 14: 110 (March), 172 (April) 1923.
7. Naegeli, O.: Blutkrankheiten und Blutdiagnostik, Berlin and Leipzig, 1919, p. 629.
8. Fine, J.: The Phagocytosis of Lead Compounds and Their Influence on the Activity of the Leukocyte, J. Indust. Hyg. 5: 138 (Aug.) 1923.

needed so much here as in the older countries. I have found boys working in only two trades in which there is much risk of lead poisoning, in potteries and in printing shops, but in both of these the jobs given to the boys are the worst of all. Boys clean glazed ware and carry it to the kilns, very dusty work. They sweep and dust printing shops, gather up lead scrap, tend the melting pots and clean the linotype plungers and often blow out the type cases. None of this work may be given to boys in European countries.

Girls are employed in a much greater variety of processes. They finish type by hand in foundries and they dust lead colors on linotype paper—two jobs that have been robbed of much of their danger of late by the improvement of machinery. They make small molded lead goods and they wrap objects in tin foil, which is really lead foil.[9] Probably the worst lead work that girls and women do is in the potteries and tile works, where they act as dippers' helpers, finish ware, carry small ware to the kilns, and sweep the dipping rooms. Finishing ware means scraping off the excess glaze, usually after it is dry. The study made by the U. S. Public Health Service, to which I have already referred, shows that, in this industry, women contract lead poisoning in larger proportion than men and after a shorter exposure. The average period of exposure of the men who developed lead poisoning was seventeen years, but of the women only 9.3 years, although their working day was shorter. Among fifty-eight male ware carriers, there was no case of lead poisoning, but sixty-two women doing the same sort of work had a rate of almost 5 per cent. Among seventy-one male dippers' helpers, the rate of plumbism was 8.4 per cent.; among 149 female dippers' helpers it was 14.4 per cent.

The number of cases of lead poisoning among American women is, if one can judge from the literature, extremely small. Gilman Thompson saw only one woman among 268 lead poisoning patients in New York; Edsall, none among the ninety-eight cases treated in the Episcopal Hospital in Philadelphia; E. E. Pratt, two in 109 cases of serious poisoning in New York City; the Illinois Occupational Disease Commission, only eighteen in 578 cases, which occurred in that state in 1909 and 1910. But the form that it takes in women when they do become poisoned is severer than in men. When I studied plumbism in the potteries, in 1911, I found a rate among the men of 8 per cent., and only one in seventeen of these men had had lead encephalopathy; among the women the rate was 14 per cent., and one in four and a half had had some form of encephalopathy.

FORMS OF PLUMBISM

The forms of plumbism differ much in the different industries, according to the severity of the exposure. In smelting, to a slighter extent in refining, in certain processes of storage battery making, in stripping white beds and emptying dry pans in white lead works, in grinding and packing oxids, in sandpapering white lead paint on wheels and bodies, or in small enclosures, such as ship cabins and the lavatories of Pullman cars, in mixing rubber compounds and working them up on the mills, in scattering enamel over sanitary ware and in paint grinding, the man may be exposed to large quantities of finely divided lead compounds, and his poisoning will develop rapidly and show typical symptoms, colic, encephalopathy, palsy. The same thing may happen in a neglected pottery, in a neglected machine shop where lead tempering is used, or in any place where an occupation not necessarily dangerous becomes so by reason of careless management. On the other hand, plumbism is likely to come on slowly and present a much less characteristic picture in painters, plumbers, makers of lead pipe, sheet and wire, printers, and dippers and kilnmen in potteries, tile works and terra cotta works. In the course of the last twelve years I have secured reports of 131 cases of that supposedly rare form of plumbism, lead encephalopathy, taking that term in the sense in which Tanquerel first used it, to cover all forms of cerebral involvement in lead poisoning. These men and women came from the following trades: Lead smelting and refining, forty-two; white lead and oxid roasting, twenty-four; pottery and tile glazing, seventeen, of whom twelve were women and five men; painting, fifteen; enameling sanitary ware, ten; making storage batteries, seven; dry color grinding, three; mixing rubber with litharge, three; and one each from glass making, brass founding, making bearing metal, making sublimed white lead, printing, and cleaning stencils that had been used to letter freight cars with white lead paint. The remaining four were coroners' cases, men dying without recovering consciousness, and the only note as to their occupation was "lead worker."

All these, except one of the color grinders, the printer, and eleven of the fifteen painters, had the acute form of encephalopathy, ranging from a mild case, with headache, insomnia, disturbance of sight and transient mental confusion or momentary loss of consciousness, to the severe cases with delirium, coma, convulsions, death or recovery with mental impairment more or less lasting. In the case of the thirteen mentioned, the form was a slowly progressing mental deterioration, which in the color grinder seemed to be a part of his extreme cachexia, but in the others resembled general paralysis with arteriosclerosis. One of the four painters who had acute encephalopathy was a lad of 19 years; another had been on a sandpapering job inside for nine weeks; a third was a carriage painter; the history of the fourth could not be obtained.

In other words, the men and women who suffered from this peculiarly severe form of acute lead poisoning had all been exposed to lead dust or fumes in the air, as was noted by Tanquerel des Planches as long ago as 1836. Tanquerel,[10] whose study of more than 2,000 cases left little to be added in the way of clinical observation, declared that he had never seen a case of typical, severe lead colic or encephalopathy which could not be traced to the breathing of fine lead dust or "lead emanations," and there are abundant confirmations of this statement in the literature of all those countries which take occupational poisoning seriously enough to seek for its sources.

We shall never adopt effective means of prevention of plumbism in industry till we accept the fact that the danger lies in the air the workman breathes more than in his personal habits. American industry is still largely dominated by the old idea that a worker acquires poisoning from the lead on his hands and that the way to protect him is to urge him to wash thoroughly before eating, laying special stress on the importance of scrubbing his finger nails. I have never been able to picture to myself just how the employer and the physician think the lead under a man's finger nails gets into his food. As a matter of fact, that source of poisoning

9. A few become skilled printers, but among 1,532 linotypists I found only fourteen women, and among 3,800 compositors, only 117 were women.

10. Tanquerel, L.: Lead Diseases, a Treatise from the French of L. Tanquerel des Planches, translated by Samuel L. Dana, Lowell, 1850.

is relatively unimportant. Men do not habitually suck their fingers; they eat only three times a day, but they breathe in the factory air some fourteen times a minute. A few weeks ago I watched a group of negroes emptying pots filled with freshly corroded white lead into an open truck, working in a fog of the white dust. The employer, to whom I suggested substituting modern methods, with enclosed trucks and extensible exhaust pipes, assured me that he had no trouble at all with these men, for he saw to it that they took a bath at the end of the day. The real cause for the apparent immunity from plumbism was revealed by the foreman, who told me that he tried not to keep any one gang longer than two weeks so as to avoid serious trouble.

CONCLUSION

Industrial lead poisoning has decreased in the last decade in proportion to the numbers employed, perhaps not absolutely, because so much more lead is used and so many more are exposed to it. We have learned much about its nature and its prevention, but we do not know much about its actual prevalence, and we do not carry out all our knowledge as to prevention. It is not yet treated with the same respect in medical schools as are such diseases as malaria and typhus fever and cholera, and yet, in our large industrial centers at least, it is certainly far more important than any of those. Perhaps it is at last coming into its own, and the next decade may see as much interest devoted to its detection and diagnosis and prevention as was given in former years to typhoid fever, with such excellent results.

RECENT INVESTIGATIONS OF ABSORPTION AND EXCRETION OF LEAD IN THE ORGANISM *

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The poisoning caused by lead has been studied since very ancient times. During the last two or three centuries, plumbism has attracted particular interest because of its widespread occurrence. In 1616, Citois, a doctor from Poitiers, showed that the symptoms commonly known as the colic of Poitou were due to the use of bad wine treated with lead, and, in 1767, Sir George Bacon of England wrote an essay in which he traced the cause of so-called Devonshire colic to the use of lead in making cider. Stockhausen, about the middle of the seventeenth century, and several others, somewhat later, published excellent clinical descriptions of the disease, but the best and most accurate picture is that given by Tanquerel des Planches. His two volumes, published in 1834, contain material gathered from 1,200 cases of lead poisoning, and are so complete that later investigations have added little to the knowledge of the symptoms and signs of lead poisoning. Since 1840, the disease has been widely studied, and, during these more recent investigations, Annushat, Heubel, Prevost and Binet, Meillère, Erlenmeyer, and Legge and Goadby are probably the outstanding figures, except for such students of industrial conditions as Dr. Alice Hamilton and Sir Thomas Oliver.

Three years ago, an investigation was started in this laboratory for the purpose of throwing further light on the various mechanisms involved in plumbism. Though the literature on the subject is very full, it was soon clear that a majority of the fundamental physiologic problems of the disease were still for the most part unsolved because of contradictory, inaccurate or incomplete data. We have, therefore, carried out a series of investigations of the absorption, retention, and excretion of lead, and the mechanism of its action in the body, in order to obtain a full scientific picture of the disease as a whole. Since detailed discussion of the results would be long, I shall briefly sketch our findings here, and leave a more detailed account of the experiments and their significance to our other publications.[1]

ABSORPTION

The relative amount and rate of absorption of lead from the gastro-intestinal and respiratory tracts have been the subject of much experimentation, and are important factors in the etiology of the disease. Up to a few years ago, the gastro-intestinal tract was always considered the principle path by which lead entered the organism. The Agenda of the International Labor Office of the League of Nations, in 1921, states that "the digestive canal is undoubtedly the most important" path of entry. "The respiratory canals have only a secondary importance in this connection, and even this is still contested."[2] We, however, soon found that when lead was given by stomach tube to cats, most of it could be promptly recovered in the feces. Later, it became clear that this occurs partly because most of the ingested lead is not absorbed, and partly because a greater portion of the fraction that is absorbed is caught by the liver and reexcreted into the intestinal tract in the bile. Therefore, much of the lead that enters the gastro-intestinal tract is not absorbed into the organism, but either is eliminated directly or never passes beyond the liver. Very large doses (50 mg. per kilogram three times a week) are required to poison a cat, when given orally, and must be continued for weeks before

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* Read before the joint meeting of the Section on Pharmacology and Therapeutics and the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. These, to the present, include:
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symptoms of intoxication appear.[3] Absorption from the respiratory tract, on the other hand, is very rapid and dangerous. Blumgart,[4] working in this laboratory, found that, within twenty-four hours, a relatively large quantity of lead could be absorbed by the organism when the only path of entry was through the nose and the mouth. This he did by tying off the esophagus, and by inserting into the trachea a cannula, through which the animal breathed. In such a preparation there is no connection between the nasopharynx and the lungs or stomach, and inhaled substances cannot enter the gastro-intestinal tract. Lead carbonate dust, even though it is quite insoluble, is rapidly absorbed when sprayed into the nose under these conditions. Blumgart determined this by analyzing the various organs of the body for lead.

Injection of lead into the trachea, and so into the lungs, of animals prepared in this way leads to similar results. Indeed, as much lead may be absorbed from one injection into the respiratory tract in one day as from gastro-intestinal exposure lasting for months.[3] It is thus clear that lead can be readily absorbed from any part of the respiratory tract, and that this absorption is more rapid and therefore more dangerous than that from the gastro-intestinal tract. The degree of respiratory absorption is evidenced not only by the quantity of lead absorbed, but also by the rapid appearance of the lead line and other characteristic symptoms. The reason for the great rapidity of absorption from the respiratory tract is that, by this route, lead enters directly into the general circulation instead of passing through the liver, as in gastro-intestinal absorption. It thus reaches the more vulnerable tissues with greater ease.

We have made no study of absorption of lead through the intact skin. There is some evidence that this may occur, particularly in working with lead in oil, but the known cases are rare, and the degree of absorption must be extremely slight. The problem was recently investigated by Süssmann,[5] who reported that lead is recovered in the urine after application on the skin with a fatty base; but his results are not really conclusive, because the quantity of lead absorbed by the body was not determined after death.

DISTRIBUTION

A series of experiments in this laboratory on subcutaneous absorption has shown that a redistribution of lead does occur, but slowly, and that, whereas a lead line and other signs of absorption of lead appeared before death, and small quantities of lead were found distributed through the organism after death, this solution and distribution is relatively slow, and probably always plays a very minor rôle in the etiology of lead poisoning. An analysis of 200 cases by Bonhoff,[6] to determine the incidence of lead poisoning in veterans of the World War who still carry in their systems fragments of shell, indicates that plumbism is very rarely caused by such deposits of lead in subcutaneous or muscular tissue.

After lead is absorbed, it is carried chiefly in the blood plasma, and to a small extent in the red cells, as the tertiary phosphate.[7] The concentration may be far higher than is possible in Ringer solution, because the lead phosphate is so dispersed in the colloidal blood plasma that it does not precipitate. The results of the action of lead on the red cells are striking.[8] This reaction must occur as the lead is absorbed, for lead phosphate is formed in the cells. This could not occur after lead had reached an equilibrium as colloidal lead phosphate in the plasma. The cells affected hemolyze less readily than normal cells in diminishing concentrations of Ringer solution; their surface shrinks, and they break up more readily than normal cells; they lose their power of agglutination, and have a surface which is less sticky than normal. All abnormalities are caused by the effect of lead on the red cells, which renders them hard, less elastic, and far more brittle than normal cells. Consequently, when these "leaded" cells circulate in the body, with all the trauma attendant on passage through the capillaries, they break up rapidly in the peripheral circulation, and the anemia so commonly seen in lead poisoning develops.

Since lead is a cumulative poison, there must be some place in the body where it can be retained in fairly large quantities. This storehouse is the skeleton.[3] The deposited lead is in the hard bone and not in the marrow, except for small traces in the bony spicules. Dr. Minot obtained clear proof of this by producing lead poisoning in chickens, and examining the so-called respiratory bone of the wings, which consists of a shaft without marrow. These bones contained relatively as much lead as did the other bones of the chicken, and therefore demonstrated that it is not the marrow that retains lead but the hard bone.

Dr. Minot found that during different stages of intoxication the distribution of lead within the body varies somewhat. If large quantities of lead are being taken into the body from outside sources or are being liberated from the bones, lead is distributed generally throughout the body, and the percentage in the bones is reduced. Under these conditions, acute symptoms of poisoning occur. If absorption is slower, then lead migrates to the storehouse in the skeleton, where about 95 per cent. is held without harm during the chronic stages of plumbism. These facts are of practical importance in the pathologic diagnosis of lead poisoning at necropsy, when a relatively large percentage of lead in organs other than the bones points to a diagnosis of an active lead intoxication; whereas lead in the bones alone merely implies that absorption has occurred at some time during life, and that lead was stored, but that it was not the cause of severe symptoms at the time of death.

This deposition of lead suggests a mechanism similar to that involved in the deposit of calcium phosphate, and it therefore became of interest to investigate whether their excretion was at all parallel. Repeated observations have shown that under conditions which favor storage of calcium in the body, i. e., when there is a positive calcium balance, the excretion of stored lead diminishes; and that when conditions are unfavorable for retention of calcium, i. e., when there is a negative calcium balance, the excretion of stored lead increases.[9]

EXCRETION

But it has been found that even under normal conditions within the body there is a gradual excretion of the lead stored in the bones. Lead has been found in the stools of persons who have had no exposure for more

3. Minot, A. S.: Lead Studies, V (Footnote 1).
4. Blumgart, H. L.: Lead Studies, VI (Footnote 1).
5. Süssmann, P. O.: Beitrag zur Frage der Permeabilität der intakten Haut für Bleiverbindungen, München. med. Wchnschr. **65**: 1407, 1918.
6. Bonhoff, F.: Ueber die Giftwirkung der Blei Stechschüsse, Beitr. z. klin. Chir. **126**: 324-333, 1922.
7. Fairhall, L. T.: Lead Studies, IX (Footnote 1).
8. Aub, J. C.; Reznikoff, Paul; and Smith, D. E.: Lead Studies, III (Footnote 1).
9. Minot, A. S., and Aub, J. C.: Lead Studies, XII (Footnote 1).

than two years, and Oliver reports finding it in the urine of a woman eleven years after exposure. There may be, therefore, an intermittent stream of lead entering the circulation from the bones, which is then gradually excreted.

Knowledge of the conditions favoring and hindering liberation of lead is, of course, of fundamental importance, for it is on this that the treatment of plumbism must be based. A careful study of the liberation of lead from bone and of its consequent excretion by the organism has therefore been made in this laboratory. Data show that during starvation the character of chronic lead poisoning changes somewhat; acute symptoms may develop, and at necropsy the absorbed lead is found distributed more generally through the body than is typical of the chronic condition. A decreased percentage is present in the bones, while the quantities in the liver, gastro-intestinal tract and other tissues are relatively increased. This suggested that during starvation there is something unusual in the metabolism of the body which sets lead free from the bones. Acidosis seemed the most probable explanation for the change, and an investigation based on this hypothesis was undertaken.

The object of the experiments was to produce acidosis artificially in thoroughly "leaded" subjects by the ingestion of acid, and to observe the resultant changes in distribution and excretion of lead.[10] It soon became evident that if acids are given in large quantities, particularly when the calcium balance is negative, the excretion of lead increases markedly.

A series of experiments was performed on cats that had absorbed lead from the lungs, but were no longer excreting lead when their diet was normal. With a milk-free diet containing very little calcium, these animals were given various forms of acid as medication—phosphoric, lactic and hydrochloric. Of these, the most efficient is phosphoric, probably because it can be taken in greater quantities than hydrochloric, and is not burned within the body as is lactic acid. Probably the agent that most efficiently liberates lead, however, is ammonium chlorid. As Haldane[11] pointed out, the ammonia changes to urea, and liberates hydrochloric acid within the body. Thus, one may ingest a large quantity of acid without drinking disagreeable quantities of acid. Of course, this procedure yields only an end-result and gives no hint of the amount of lead liberated from bone, carried through the body, and eventually replaced in the skeleton without being excreted.

The real reason for the increased liberation of lead during acidosis is probably the fact that lead in the form deposited in the skeleton—i. e., tertiary lead phosphate—is least soluble at the normal hydrogen-ion concentration of the body. This salt is more easily dissolved under either more acid or more alkaline conditions. Consequently, the ingestion of acid may in two ways favor liberation of lead: First of all, when the calcium content of the diet is low, acid calls on the reserve store of base in bone so that lead is liberated with calcium; secondly, the local change in the hydrogen-ion concentration of the bone renders lead more soluble—it is converted to the di-lead salt and released. Both phosphoric acid and ammonium chlorid with a low calcium diet almost invariably increased the excretion of lead from the organism.

10. Aub, J. C., and Minot, A. S.: Lead Studies, XIII (Footnote 1).
11. Haldane, J. B. S.: Experiments on the Regulation of the Blood's Alkalinity, J. Physiol. 55:265 (Aug.) 1921.

TREATMENT

In treating patients with lead poisoning, the most satisfactory method now appears to be to give a diet with low calcium content, consisting of meat, potatoes, rice, macaroni, apples, bananas, sugar, salt, milk-free bread and butter that has been melted in hot water and skimmed off the top; to avoid absolutely milk, eggs, green vegetables, and fruits not included in this list. With this, either from 8 to 12 gm. of ammonium chlorid is given daily, or ten doses of about 20 to 25 c.c. of dilute phosphoric acid so sweetened and diluted that it tastes like lemonade. A small amount of gin added to this phosphoric acid mixture makes it much more palatable.

Sodium bicarbonate taken by patients in quantities of 40 gm. a day increases the excretion of lead. The average increase in the excretion of lead during ingestion of acid is fourfold; during ingestion of alkali, about double. All these treatments do not alter the amount excreted in the urine very definitely; the increase appears in the feces.

When acid is given and the calcium balance becomes increasingly negative, the excretion of lead tends to increase progressively; when alkali is given, however, although the calcium deficiency does not increase, the excretion of lead does. In this case, lead excretion is apparently independent of calcium excretion. Repeated observation has shown that, with a high calcium intake (positive calcium balance), lead excretion tends to diminish rapidly. This provides means for controlling the storage of lead in the organism. To increase excretion, it is only necessary to produce a negative calcium balance and to cause mild acidosis. On the other hand, to store lead in the bones so that it will not be free in the circulation and cause damage, it is only necessary to give a diet containing much calcium in the form of milk or calcium lactate. These facts account for the efficacy of milk in preventing toxic symptoms among lead workers. The milk produces a positive calcium balance, which favors relatively harmless storage in the body. It does not, as has been generally supposed, prevent absorption of lead.

Previous treatments for lead poisoning have consisted largely in catharsis and the use of potassium iodid. Catharsis has been known since the middle ages as excellent treatment for plumbism, and is the basis of the famous treatment for lead colic first used in the Charité Hospital in Paris, in 1602. Our experiments with magnesium sulphate as a cathartic have not demonstrated that it increases the excretion of lead when given alone. It does, however, relieve the spasm which appears to produce colic, for colic subsides as catharsis is established. Potassium iodid was first used in the treatment of lead poisoning by Melsens, in 1840, and has been employed ever since as an effective agent for increasing the excretion of lead. Many experiments with this drug have been performed in this laboratory, to determine whether it does or does not increase excretion of lead, and they have demonstrated that it does stimulate excretion. Indeed, ingestion of potassium iodid causes lead to appear in the urine and the feces, when they have been normal before its use; but it is not nearly as effective an agent as the various acids. Peuchet first pointed out that its effects are of relatively short duration, that the increased excretion of lead continues for a few days, and that then there is a distinct tendency for the rate of excretion to return to that maintained before potassium iodid was given.

Scattered through the literature are references to occasional cases in which symptoms of lead poisoning have been precipitated by various forms of medication long after exposure to lead. Oliver gives an instance of this after ingestion of potassium iodid. The only suggestion of the action of acid which we have been able to find in the literature was made by Sabrazès,[12] who mentions a case of lead poisoning, with colic and stippling of red blood cells, which developed, long after the removal from the lead hazard, as a result of taking an excess amount of the citric acid drink used so commonly in France. The explanation for such a tardy appearance of lead intoxication is clear in the light of investigations already mentioned in this report.

Untoward effects from our rather drastic therapy have not been observed in any of our patients, in spite of the fact that many of the subjects were very heavily "leaded." But in our cats, the rapid excretion of lead consequent to the administration of large doses of sodium bicarbonate was maintained for many weeks, and symptoms developed which were quite similar to those following overdoses of lead—progressive emaciation, lack of appetite, and general slovenliness. We have observed no such appearances in men, but this is not surprising, for, even in the midst of medication, the amount of lead liberated is probably much below that free in the blood during active absorption. This seems evident from the postmortem distribution found in fatal poisoning in animals and man.

We have here summarized part of our work of the last three years, although, of course, many ramifications have been omitted. These and many experimental data will appear in other publications. In this paper, an attempt has been made merely to describe briefly the methods of absorption, retention, and excretion of lead in the organism.

SUMMARY

Lead is absorbed more rapidly through the whole respiratory tract than through the gastro-intestinal tract.

It is carried in the blood stream as a phosphate.

Lead is stored in the calcareous portion of the bones.

Damage results only when lead is being transported after absorption or following release from the bones.

In active plumbism, lead is distributed more widely through the body than in the chronic, inactive form of the intoxication.

The administration of acids or alkalis, particularly when associated with a low calcium intake, accelerates the release of lead and its excretion.

A positive calcium balance in the body favors retention of lead in the bones.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SHIE, HAMILTON, AND AUB, MINOT, FAIRHALL AND REZNIKOFF

DR. PAUL J. HANZLIK, San Francisco: My familiarity with the subject of lead poisoning is limited to the literature and to some experiments with lead on pigeons. The papers have given a good general review of this subject. There are two views regarding the nature of lead poisoning. One is that the poisoning is concerned with the accumulation of injuries from the continued passage of small concentrations of lead through the body; the other refers the poisoning to the accumulation of lead deposits in various organs. Both views are supported by what appear to be good experimental evidence. Dr. Aub appears to adhere to the notion pertaining to the accumulation of lead deposits. I believe it was claimed by certain French investigators a long time ago that lead is selectively deposited in bones; but in any review of the subject one finds all kinds of statements regarding the distribution of lead. Some claim that it is deposited to a greater extent in the liver, brain and kidneys. The variable results on distribution reported are probably explained, in part, by the employment of different and unreliable chemical methods, considering the extremely small quantities of lead involved, and, in part, by the choice of different species of animals. Certain French authors report the distribution to be quite different in man from that found in animals. If this is true, it is erroneous to transfer results obtained on animals to human beings. This appears to be one of the important difficulties in getting a good idea of the nature of chronic lead poisoning in man, and at the same time, of course, it is difficult to elaborate a satisfactory treatment. Straub and Erlenmayer made studies on chronic lead poisoning in cats, and found no selective deposits in the organs. When the administration of lead was stopped, the poisoning also stopped. They came to the conclusion that the poisoning was not concerned with deposits of lead in the various organs, but was better explained by the accumulation of injuries from the continued passage of small amounts of lead through the body. They estimated the quantity necessary for symptoms of poisoning to be in the neighborhood of about 0.01 mg. hourly, for about sixty days, in a cat. From what has been said, it is apparent that the testing of various agents used in the treatment of lead poisoning would be difficult, but this has been attempted by a few investigators, and recently by Scremin of Padua. Iodid has been a favorite. Scremin tested the effects of iodid on artificial deposits of lead compounds, and on their solubility, using chemosis as a test. He could demonstrate no beneficial influence of iodid, and concluded that the clinical benefiits from iodid are exerted in some way through an action on the metabolism. I wonder whether the beneficial effects of the acids and alkalis reported by Dr. Aub might not be explained through an action on metabolism in somewhat the same way as has been suggested for iodid. I am not altogether convinced of the explanation given by Dr. Aub. It appears to me that most of the therapeutic measures used in the treatment of plumbism still rest on an empiric basis, and that the nature of the poisoning is still not understood as far as man is concerned.

DR. EMERY R. HAYHURST, Columbus, Ohio: One point in the diagnosis of lead poisoning which I think is very practical and has not been touched on is the fact that we must remember that lead poisoning may come from three sources in practical life—industrial, cosmetics and drugs. Two of these, at least, show in the skin. Many workers in lead do not know it. Many of the compounds with which they work are labeled or have peculiar trade names so that it is not known to the man or the physician that they contain lead. This is equally true of cosmetics. Therefore, I would advocate that every physician keep on his diagnostic shelf a little bottle of 10 per cent. solution of sodium sulphid, that he take a swab and smear this on the face, arm or chest of the worker or suspected patient —best on a spot not bathed frequently—and see whether the characteristic black sulphid discoloration takes place, indicating the presence of lead. Black sulphids other than lead are not apt to be found under the circumstances.

DR. TORALD H. SOLLMANN, Cleveland: I should like to ask Dr. Aub to give us some idea of the quantity of lead that is mobilized by the acid administration and some idea of the ratio this bears to the quantity of lead that induces intoxication, when there is daily absorption. I would also inquire whether during the acid administration any toxic symptoms have appeared. I recall a statement by Brouardel that with lead patients in the hospital he could, as a rule, bring on at will an outbreak of lead symptoms by giving salad that contained vinegar.

DR. J. BIRNEY GUTHRIE, New Orleans: It would seem rather unfortunate, in summing up the effects of chronic lead poisoning, if we omitted the subject of the tendency to abor-

12. Sabrazès, Bourret and Leger: Les hématies à granulations basophiles dans le saturnisme expérimental et clinique, J. phys. et path. gén., Paris 2: 941-946, 1900.

tion occuring in women suffering from this poisoning. Sir Thomas Oliver lays great stress on this.

DR. MARVIN D. SHIE, Cleveland: So far as abortion is concerned, there is no doubt at all that lead has a selective action on the generative system, probably more marked in the female than in the male. There is no question that dysmenorrhea is increased or produced, and that abortions occur more frequently among those women who are exposed to the lead hazard. McCord has recently reported an interesting case of lead orchitis and, as I mentioned in my paper, oophoritis sometimes occurs.

DR. JOSEPH C. AUB, Boston: Most of the observations on distribution of stored lead have been done in isolated cases, and most of them with unsatisfactory methods. The outstanding studies of Heubel, Prevost and Binet, Meillere and Erlenmeyer have not yielded data that thoroughly agreed, and therefore Dr. Minot restudied the subject with the satisfactory chemical method devised by Dr. Fairhall. Her work, which will appear in the August number of the *Journal of Industrial Hygiene*, should settle the controversy and establish, what several others have already shown, that lead is stored largely in the bones. This is true after subcutaneous injections as well, although Erlenmeyer did not discover it. It is true also of man. In seven necropsies, both acute and chronic cases, brought to us for diagnosis we have found the distribution to be similar to that found in animals. The former divergent views are due to many poor observations. Dr. Hanzlik also questioned whether it was not the circulating lead, rather than the stored lead, that caused damage, as Straub and Erlenmeyer suggested. We agree with that view, but a lead stream is maintained from the storehouses, as demonstrated by the long continued excretion. If lead would stay indefinitely in the bones it would not be dangerous, and we are not absolutely certain that it is better to try to get rid of it rather than to store it. The final decision will develop from further investigations. We can, however, tend to control its excretion. The excretion of lead will be reduced on a high calcium diet. A negative calcium balance will increase the rate. At present, we try to reduce the lead stream, in acute cases, and give milk and calcium lactate until the acute manifestations have subsided. We then increase the lead excretion by our various methods, and have never seen any symptoms develop in man which would suggest the production of acute manifestations. This was true in even our severest cases. It seems wiser to us to do this, for the late attacks, which Dr. Shie and Dr. Hamilton have mentioned, should thereby be reduced. Dr. Sollmann asked two questions: First, as to the quantity of lead mobilized daily. Usually, without treatment, the excretion is much less than half a milligram, and very rarely more than that amount. With treatment, this amount is approximately increased fourfold, and, with a good reaction, a little more than 2 mg. may be excreted. Second, as to the minimal toxic dose for man, Legge has stated that 2 mg. daily over a long period of time may produce poisoning. We have made no experiments on this point, but Dr. Hanzlik has investigated it in birds.

DR. EMERY R. HAYHURST, Columbus, Ohio: Painters have been using the starvation method of ridding themselves of lead poisoning. Is that a good procedure?

DR. JOSEPH C. AUB, Boston: The treatment is not a simple one. However, it seems logical, because it fits in with all our experimental evidence. The patients take in about 0.1 gm. of calcium a day, but the excretion continues at the rate of 0.3 or 0.4 gm. a day.

Permissive and Mandatory Health Laws.—For the purpose of public health advancement, a permissive law is superior to a mandatory one; just as an affirmative law is superior to a prohibitory one, if we view the shaping and promotion of health legislation as an educational process. It is far easier to lead the public to a course of public policy than it is to drive them, even though the former procedure may consume a longer period of time. The use of a mandatory law can be justified only when there is a clear and unmistable expression of public opinion in favor of drastic dealing with a given situation.—R. G. Paterson: *Hosp. Soc. Serv.* 9:19 (Jan.) 1924.

THE APPENDIX IN RELATION TO, OR AS THE CAUSE OF, OTHER ABDOMINAL DISEASES *

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In a consideration of the progress of medicine during the last four decades and the periods during which certain diseases, such as appendicitis, have been discussed, credit should first be given Reginald Fitz for his masterful paper of 1886 on appendicitis, which clarified the subject for the medical profession the world over. After a number of years, during which the subject was discussed and various methods of palliation, treatment and operation were adopted, the mortality was greatly reduced and the safety of interval operations was recognized. During this period, nearly all medical journals considered some phase of appendicitis in all their issues and then for a like period there was a dearth of interest and of articles on the appendix, and the discussion of the subject seemed to be finished. Statements are made that the mortality rate today is higher than in 1910, and the journals are again publishing articles on diseases of the appendix. The higher mortality rate is due to the fact that the younger generation of practitioners, who did not benefit by the early period of discussion, have not recognized the seriousness of such infections and therefore have not made haste to diagnose and operate early in these cases. Too many operations are performed during the dangerous intermediate period between early and late infection, and possibly too much is attempted in the late operation when there is an abscess. Thus the surgeons for each period must discuss the subject and clarify it for themselves, since human experience, which affords opportunity for progress, can be passed on only to a limited extent.

In the discussion of appendicitis, the belief has often been expressed that an enormous number of persons must have died from the disease in the past. But appendicitis was rare in past ages; it is a disease of modern life. A soil has become engendered and been made susceptible to disease by changes in food that have developed within a few decades, undoubtedly having the same relationship to modern life as that which has possibly contributed a factor in the increased percentage rate of cancer. The present age of evolution has rendered such vestigial structures as the appendix a source of danger, not only because of the acute and chronic diseases with which it may be affected, but because it is a source of focal infection, like the tonsils, whose function also is probably not as necessary now as in past ages.

FOCUS OF DISEASE

The appendix as a focus of disease has long been recognized, and I wish here simply to call attention again to its diseases in relation to other abdominal diseases or as the cause of them. One of the puzzling factors in abdominal diseases that is noted occasionally is the hyposensitiveness of diseased areas in the stomach, gallbladder and appendix, in view of the extent of the disease found on exploration or found in one of these structures during operation for other conditions, or on exploration to determine whether the appendix is

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

diseased and is a causative factor in reflex gastric symptoms. The appendix is often removed at the time of an abdominal operation for other disease conditions, especially in pelvic operations performed through the abdomen. The appendix does not cause disease in the pelvis by the dissemination of organisms through the blood stream or by way of the lymphatic system, but it may cause disease in the pelvis by contact and adhesion if it is inflamed or by contact with pus if it has ruptured. Conversely, the appendix may be involved in pelvic inflammation and its resistance lowered. The former is also true of its relation to the right ureter; an inflamed appendix adherent to the peritoneum over the right ureter at the brim of the pelvis may lead to a pathologic condition with blood in the urine and to an erroneous diagnosis of renal disease. Acute or chronic abdominal lesions are often attributed to the appendix; thus, in one third of the cases of stones in the left ureter, associated with colics, the appendix is removed without relief, and in approximately two thirds of the cases in which there is a similar condition on the right side, the appendix is removed ineffectually.

TYPES OF INCISION

The foregoing leads to a consideration of the type of abdominal incision for operations on the appendix. Various statistical reports have been made, from time to time, which show that in from 8 to 24 per cent. of cases no benefit is derived from appendectomy when it is performed for supposed appendicitis. In operating on children, the McBurney incision is satisfactory; in adults, a considerable percentage of such incisions are followed by inguinal hernia within from one to two years after the operation, because of muscular relaxation at the internal ring, probably due to injury of a nerve. In adults, a straight right median rectus incision is greatly to be preferred, as it permits exploration and is readily enlarged. McBurney's incision is not large enough for satisfactory exploration and it cannot be enlarged satisfactorily; thus the real cause of disease in the gallbladder, pancreas, stomach or duodenum, and occasionally in the pelvis, may be overlooked.

The work of Rosenow on the reproduction of appendicitis by bacteria taken from diseased appendixes shows that appendicitis is not caused by the infection of the colon bacilli, but usually by streptococci of much the same type as inhabit the crypts of tonsils and the apical abscesses of teeth. The inflammatory exudate becomes infected, secondarily, by the colon bacilli in cases of perforating abscessed appendix.

I wish to call attention to the danger of removing the appendix in extensive pelvic operations in which the separated adhesions and manipulations are so extensive that there is an opportunity for more than an ordinary amount of effusion of blood. Although slight with surgical care, in such cases the removal of the appendix affords opportunity for infection; and in such cases the cut appendix should be regarded much as an accidentally perforated colon would be. If it seems advisable to remove the appendix, it can be more safely accomplished eight days after the major operation. If the appendix is apparently not diseased or only slightly diseased, it had better be left alone in major operations in which large areas of the lower abdomen are traumatized. Removal in such cases shows bad judgment, which is proved only when the patient does not convalesce satisfactorily or dies from infection.

However, the appendix undoubtedly is the source of chronic infection in the upper abdomen, and, as a rule, should be examined and removed during operation on the gallbladder or on ulcers of the stomach or duodenum. If, in examination of the abdomen before operation for pathologic conditions other than appendicitis, the appendix is found to be much more seriously diseased than the symptoms had indicated, or if in operations on the chronic diseased appendix the condition is found to be much more extensive and serious than was expected from the symptoms, the appendix should be considered a possible focus of disease involving the upper abdomen, and the exploration should be extended to this region by increasing the length of the incision, which is possible if it is a right median rectus incision. So far as the patient is concerned, if he is chronically sick from gastric trouble with pyloric spasm, even if it is the result of reflex action from disease of the gallbladder or appendix, he is entitled to relief; and the greatest degree of permanent relief is usually best attained by surgery. If operation fails to confirm supposed disease of the gallbladder or ulcers of the stomach or duodenum, the appendix should be examined, as it may be the offender.

METALLIC MERCURY SUSPENSIONS

THERAPEUTIC RESULTS AND DELETERIOUS EFFECTS OF THEIR INTRAVENOUS AND INTRAMUSCULAR INJECTION *

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AND
TORALD SOLLMANN, M.D.
CLEVELAND

Intravenous injections of suspensions of finely divided mercury were made by Fuerbringer [1] in 1880 for the purpose of studying the fate of mercury in the tissues of animals. With the aid of acacia and glycerin, he prepared a stable suspension in which the mercury globules were smaller than the blood corpuscles. However, such injections of suspended metallic mercury do not appear to have been tried clinically until recently, when a proprietary preparation of this character was introduced, originally under the suggestive name of "lueside," which has been changed to "mercodel." The manufacturers claim that this produces very striking therapeutic results, with absolute safety, without injury to the vein; in fact, without any objectionable features. Since this method of introducing mercury for therapeutic purposes is a distinct novelty, the claims require careful control; a task that was assigned to us by the Council on Pharmacy and Chemistry, to which the preparation had been submitted. The material was supplied by the manufacturers, through the secretary of the council, as two lots of the commercial ampules.

Mercodel is a fine trituration of mercury with glucose, in the ratio of about 1:5. The trituration divides the mercury into very minute particles—said to range "from half the diameter of a blood corpuscle" to the submicroscopic; and it also surrounds them with a film—whether of air, of mercury vapor, of mercury oxid or of surface electric charges is not known—which delays their running together when the powder is sus-

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1. Fuerbringer, P.: Arch. f. path. Anat. 82:491, 1880.

pended in water. For clinical use, the contents of a commercial ampule (0.5 gm. of mercury and 2.43 gm. of glucose) are shaken with 50 c.c. of sterile distilled water. This forms a suspension, isotonic with blood plasma and containing 1 per cent. of mercury. This suspension is strained through a pledget of cotton and is then to be rapidly injected into a vein. The quick manipulation is necessary because the mercury promptly settles out of the suspension; but it can be reincorporated by shaking. Mr. R. L. Howard of the pharmacology department has found that this separation can be materially delayed by the addition of 0.6 per cent. of acacia, and presumably much more by higher percentages. Dextrin was less effective. The acacia could be incorporated in the powder and would probably be an advantage in the therapeutic administration; but it was not further tried because we had come practically to the end of the series before the improvement was suggested.

We therefore prepared and injected the suspensions strictly as directed by the manufacturers; except that the full course of ten doses was not always carried through, for reasons that will become apparent as we proceed. The manufacturers insist that the drug must be injected "twice weekly in steadily ascending doses until definite symptoms of mercury saturation appear"; i. e., slight diarrhea or tenderness of the gums. The dosage may then be somewhat reduced. According to the original directions, the injections began with 20 c.c. (equivalent to 0.2 gms. of mercury); and increased by 5 c.c. (0.05 gm.) with each injection until the full 50 c.c. (0.5 gm.) was injected. This would ordinarily be reached at the seventh injection. The dose was then kept at this point until a course of ten injections had been given. The dosage may be modified according to circumstances, and recently the manufacturers advise starting with a somewhat smaller dose (from 10 to 15 c.c.); but if the full course is given, as originally directed, the patient receives a total of 3.95 gm. of mercury in five weeks. It must be realized that this amount of mercury is much greater than the quantities introduced by the customary intramuscular injections. For instance, ten 1 c.c. injections of 10 per cent. mercuric salicylate contain only 0.6 gm. of mercury, or less than one sixth of the quantity introduced intravenously in a course of the metallic injections. The manufacturers claim that two hours after the injection nearly half of the suspended mercury is deposited in the liver, and the remainder distributed in other tissues. In any case, it must remain somewhere in the body for a long time; for while the excretion of mercury has not been studied for this particular form of administration, it is stated (Buchtala) that the kidney cannot excrete more than 10 mg. of mercury daily without serious renal irritation, which does not exist here. According to this, it would require at least a year, and probably longer, to excrete the mercury that was introduced at a single course of injections; and in the meantime the patients would be in constant danger of serious mercury intoxication in case the deposited mercury should be suddenly mobilized. It is not known whether or when such mobilization may occur; evidently, the metallic mercury must be convertible into an active form or there would be neither therapeutic nor toxic effects, but we are entirely ignorant of the rate of conversion and of the conditions that may influence this.

The propriety of introducing these large quantities of mercury without more knowledge as to their fate would have appeared dubious to us; but our doubts were allayed by the assurance of the manufacturers that the absolute safety of the method had already been established by thousands of injections on patients. We regret that we cannot confirm these claims of safety, for in our series of nineteen patients with intravenous injections, there developed two cases of very serious ulcerative stomatitis, one of which terminated fatally; and this with doses well within those advised by the manufacturers. This toxicity varies greatly for different patients in an unexplainable, unpredictable and uncontrollable manner. We tried to circumvent the toxicity by reducing the number of injections, but found that this did not appear promising, because the therapeutic result was unsatisfactory unless the full dosage was approached.

A further very serious feature of the mercury injections consists in the injury to the vein. The manufacturers claim an entire absence of such injury; and it is true that the acute injury is much less than that caused by the soluble mercury salts. However, repeated injections produce more or less inflammatory changes, which render the vein unavailable for further injections. We have used every precaution to avoid these and have also attempted to vary the technic, but without success. Presumably, some of the mercury globules become lodged in the track of the needle and become irritant as they are gradually attacked and dissolved. This very objectionable feature prompted us to try intramuscular injection, but we quickly abandoned this as unpromising, because it showed toxic effects, uncertain absorption, and marked local irritation.

These unfortunate occurrences and our failure to control them have thrown a wet blanket on the enthusiasm that was naturally engendered by the marked therapeutic response. It may be that a better knowledge of the mobilization, excretion and other conditions that influence the toxicity may render the method available in the future, but at present the risks appear to us as too great to justify a continuance of therapeutic tests.

The significant details of the individual clinical histories are given later, but a brief systematic analysis, grouped according to therapeutic response, toxic phenomena and local irritation may usefully be introduced in this place.

THERAPEUTIC RESULTS

The therapeutic results were very promising in several directions. The effect on the spirochetes could be observed in twelve cases; eight of these were primary lesions that came to us very early and therefore were especially suitable for this purpose. The organisms disappeared in the following number of days after the injections were begun: one, one, three, four, four, five, five, six, six, seven, seven, a median of four and one-half days after the first, or a day after the second injection. In some cases, the organisms disappeared as rapidly as one may see with arsphenamin. This favors the view that mercury has a direct spirocheticidal action.

The effect on the clinical phenomena of the disease was likewise satisfactory in most cases. Usually, a primary lesion or secondary eruptions or mucous patches would heal almost as rapidly from the use of these injections as from the use of the arsphenamins—they certainly disappeared faster than after the use of most mercurials. In some cases, however, the response was not so rapid. Patient 15 had a chancre of the rectum, a proliferating and moist lesion, which showed little or no improvement after three injections and

reacted only after the use of arsphenamin. Again, in Patient 2, who had patches in the mouth, the moist papules in the corners of the lips were still present and showing spirochetes after two injections. As a rule, however, the clinical reaction was excellent and even remained so for some time after the drug was stopped. Thus Patient 16, with a generalized, follicular eruption, showed excellent, rapid reaction to 0.75 gm. given in three injections and remained free from symptoms for more than a month. A generalized follicular syphilid in Patient 17 cleared up after six injections, a total of 1.8 gm., and he remained free from symptoms for six weeks, when a small mucous patch developed on the tonsil. Patient 9, also with a secondary eruption, reacted at once to four doses, a total of 1.1 gm., and, aside from the continued positive Wassermann reaction, showed no symptoms one month later.

The effect of the drug on the spinal fluid findings is more variable, but generally satisfactory. Patient 2 had a spinal fluid cell count of 24 cells; the globulin tests were positive, and the Wassermann reaction was one plus in a dose of 0.1 c.c.; three plus in 0.2 c.c., and four plus in higher amounts. After ten injections, with a total of 3.3 gm. of mercury, this changed to a cell count of 5, the globulin tests were negative, and the Wassermann reaction was negative in all doses. In Patient 5, with a cell count of 510, the globulin tests were positive and the Wassermann reaction two plus in 0.1 c.c., two plus in 0.2 c.c., and four plus in higher amounts; he showed, after ten injections (3.85 gm.), a cell count of 53, the globulin tests were negative, and the Wassermann reaction was negative in all doses. Patient 13, who had cerebrospinal syphilis, gave a Wassermann reaction of four plus in all doses; the globulin test was positive, and the cell count was 180. After four injections (1.1 gm.), the cell count was 120; the globulin test was positive, and the Wassermann reaction was still four plus in all doses. This result was not quite so convincing, and yet was very good for four injections. In Patient 4, with a secondary eruption, the cell count increased after nine injections, 3.35 gm. of mercury, from 12 to 20 cells, with no changes in the globulin test or the Wassermann reaction.

For the blood Wassermann reaction, the results were less convincing. The majority of the patients showed no change, and in two the reaction became more positive during treatment (Patient 3 after nine injections, 3.5 gm.; Patient 14, one injection, 0.2 gm.); and only two showed improvement (Patient 4 after nine injections, 3.35 gm., changed from two plus to negative; Patient 7, after nine injections, 2.95 gm., from two plus to negative).

Relation of Dosage to Efficiency.—The systematic and local side effects of repeated administration prompted the hope that a smaller number of doses than that advised by the manufacturers would be successful, a hope that was stimulated by the disproportion in the dose of this, as compared with other forms of mercury. The opportunity for studying the question was afforded by the cases in which the injections were discontinued early, either because of the onset of salivation or because of fibrosis of the veins. These showed that one or two injections suffice to clear the primary lesion of spirochetes, but that the other phenomena are not controlled satisfactorily by less than six injections and that the best results are obtained only as the full dosage of ten injections is approached. The limited efficiency of the shorter courses is seen in the following compilation, arranged according to the number of injections:

One Injection.—Only one case was observed sufficiently long to be usable. In Patient 14, with a primary lesion of three weeks' duration, a definite folliculopapular syphilid developed, and the Wassermann reaction increased from two plus to four plus, seventeen days after the injection.

Two Injections.—Patient 12, with a secondary eruption, patches in the mouth and moist papules at the corners of the mouth, became markedly salivated, but the lesions refused to heal and the spirochetes persisted.

Three Injections.—Four cases were observed. The first, Case 10, is not available, since arsphenamin had to be given to control a Vincent's angina secondary to mercurial intoxication. Case 15, a primary eruption of the rectum, did not respond to the mercury. In Case 16, a generalized follicular syphilitic eruption was cleared rapidly and completely, but the chancre and phimosis were not entirely healed, the blood Wassermann reaction continued at four plus, and spirochetes reappeared in the penile lesion after a month. Patient 18 left the hospital too early for conclusions.

Four Injections.—Three patients were observed. The first, Patient 11, developed mucous patches in the throat eighteen days after the last injection. Patient 13 was salivated when his spinal fluid was only slightly improved. In Patient 19, the skin eruption cleared satisfactorily and has not recurred (in a month). The Wassermann reaction remained positive.

Six Injections.—Two patients were observed. Patient 8 died from mercurial ulcerative stomatitis during the treatment. In Patient 17 the eruption cleared satisfactorily and thoroughly, but a mucous patch developed on a tonsil six weeks later.

The patients who received a larger number of injections (Patient 1, eight injections; Patients 2, 3, 4 and 7, nine injections; Patients 5 and 6, ten injections) generally gave satisfactory improvement.

The therapeutic results may therefore be summarized as: unfavorable with one and two injections; nonconclusive with three and four injections; good with six or more injections.

TOXIC PHENOMENA

Acute reactions were entirely absent. Especially notable was the absence of anaphylactoid phenomena—nitritoid reactions, hyperpyrexia, changes in white blood cell count—which are commonly associated with the intravenous injection of colloidal solutions. This is probably explained by the fact that the mercury particles are relatively large and not in the true colloidal state.

Renal irritation is generally either absent (nine cases, from three to ten injections, median four injections) or slight (a faint trace of albumin and a few casts; seven cases, from two to nine injections, median six injections). These would clear up in a day or two and reappear with the next injection. A "heavy trace" of albumin, with more numerous casts and red blood cells, was present only in the two cases (Cases 8 and 10; six and eight injections) in which dangerous or fatal stomatitis developed.

The phenolsulphonephthalein output was studied in Cases 2, 3, 4, 6 and 7 with the larger doses; it was practically normal.

Digestive symptoms were absent as a rule, or, if present, slight; they were notable only in two patients (Patient 4 after nine injections; Patient 10 after three

injections), in whom cramps and some diarrhea accompanied other serious mercury symptoms. The cramps did not persist. Nausea and emesis occurred only in the two cases of extreme mercurialism. One or two patients complained of malaise toward the end of the treatment, much as do patients undergoing other forms of mercurial therapy.

Stomatitis, marked by more or less salivation and swelling of the gums and tongue, occurred in most cases, but the dosage required to evoke these symptoms and the degree to which they occurred varied. After observation of the serious results in Patient 8, we were extremely careful to stop the injections as soon as even slight oral symptoms became manifest; but we found that the severe forms usually break forth in their full severity without warning, so that even extreme precaution does not guarantee against them.

Of the nineteen patients, five, or one fourth, showed no oral or other systemic toxic phenomena; the patients and the number of injections being: Patient 9, one; 14, one; 15, three; 18, three; 6, ten; a median of three injections. Two showed slight salivation or gingivitis: Patient 19, four; 3, nine; a median of 5.5 injections. Eight showed moderate salivation and edema; namely, Patient 11, four; 13, four; 5, five; 4, six; 7, six; 2, seven; 1, eight, a median of six injections. Up to this point the severity is fairly parallel to the median number of injections, although individual patients may show considerable tolerance, for instance, Patient 6, who had no salivation after ten injections. In fact, the first seven patients received from eight to ten injections each, without marked symptoms. But when we come to the more severe cases, we find that these often occur after relatively few injections; for, in ascending order of severity, these cases occurred with the following number of injections: Patient 16, three injections; Patient 12, two; Patient 10, three; Patient 8, six. The symptoms of these deserve some further discussion.

Patient 16, who received three injections (0.75 gm.) in six days, four days later developed extensive edema of the gums and tongue, with some salivation. The salivation had subsided two weeks later.

Patient 12, who had two injections (0.5 gm.), two days later had swelling of the gums, edema of the tongue, and marked salivation, with a secondary swelling of the lymph nodes under the jaw. The patient developed a heavy trace of albumin and numerous casts. The condition cleared completely.

Patient 10, who was given three injections (0.75 gm.), following the third injection and without any warning developed severe stomatitis, which progressed to extensive necrosis of the entire inner side of the mouth. This was accompanied by diarrhea, abdominal cramps, emesis, headache, and a very heavy trace of albumin, numerous casts and red blood cells in the urine. The patient's condition was serious, but he gradually recovered after several weeks.

Patient 8, who received six injections (1.95 gm.), after the fifth injection complained that the gums were a little tender; but after the sixth injection (0.45 gm.), the gums and tongue suddenly began to swell, salivation became extensive, and the patient developed a skin eruption that we interpreted as mercurial. The stomatitis became necrotic, with a secondary invasion of Vincent organisms. The urine contained a heavy trace of albumin, casts and some red cells. No intestinal symptoms were observed. The oral necrosis progressed notwithstanding the treatment, and the patient died in the fourth week after the last injection. The necropsy showed no lesions in the lower intestines, and the kidneys were not badly affected; it appears, therefore, that the lesions in this form of mercurial poisoning are localized mainly in the mouth.

We may add that Patient 20, with four intramuscular injections (0.7 gm. of mercury), also developed severe gingivitis, extreme salivation, and a superimposed Vincent's infection; and this although roentgen-ray examination showed that a great part of all four injections was still unabsorbed.

LOCAL IRRITATION

The manufacturers state that very numerous mercodel injections have been made by many clinicians without injury to the vein being reported to them. Our experience does not agree with this; on the contrary, practically all the ninteen patients showed more or less local reaction. In eight patients (averaging three injections each), the reaction was so slight that no special note was made of it: Patient 9, one; 12, two; 10, three; 16, three; 18, three; 11, four; 19, four and 6, ten.

In six others it was recorded as slight up to the number of injections stated, a median of two injections, namely, in Patient 2, one; 4, one; 8, two; 3, four, and 5, eight. In nine the endophlebitis progressed to sclerosis and obliteration, if the injections were repeated, on the average, after four injections. The patients and the number of injections were: Patient 14, one; 2, two; 1, three; 15, three; 8, four; 3, five; 4, six; 17, six, and 2, seven.

In some patients the veins of both arms were put out of commission. The inflammation may set in within twenty-four hours after the first injection and cause considerable subjective discomfort.

We took every precaution to make the technic unobjectionable. Most of the injections were made by Dr. Hutton. The nature of the mixture precludes the use of very fine needles, but the needle was sharpened before each administration; the injection was made with different speeds, etc., all to no avail. The cause of the irritation is doubtless the deposition of a little of the mercury in the track of the needle. This is indifferent at the moment, but becomes irritant as it dissolves.

This local irritation is strikingly illustrated by two cases in which some of the injection was made into the perivascular tissue. In Patient 2, a local sclerosis, through which we attempted to make an injection, became inflamed and formed an abscess. In Patient 13 an injection was probably made in part into the sheath. This produced a very tender, inflammatory reaction, extending up the vein to the shoulder, where it spread into a hot and painful subcutaneous swelling, some 5 cm. in diameter. It threatened to break down, but eventually cleared up with rest and cold applications.

The local irritation is also illustrated by the insistent complaints of pain on the part of the patients who received intramuscular injection.

It is not comfortable to reflect on what might be going on in the tissues if each of the mercury globules that is distributed through them as the result of the intravenous injections were to set up a focus of irritation, such as we see at the site of injection and such as occurs also in the lungs when volatilized mercury is condensed there as globules.[2] This calls for more thorough histologic investigation than appears to have been made so far.

2. Ricker and Hesse: Virchows Arch. f. path. Anat. 217: 267, 1914.

CONCLUSIONS

1. Intravenous injections of metallic mercury suspensions ("mercodel") produce marked therapeutic response, manifested by the rapid disappearance of the organisms from the primary lesion; prompt clearing of the secondary lesions, and improvement of the spinal fluid. These efforts start within one or two days after the first injection, but the condition relapses unless the treatment is carried further; more than six injections are required for satisfactory results.

2. The quantity of mercury introduced in a "course" is very much greater than that introduced by any other method. According to current conceptions, a large quantity of mercury would be expected to remain in the body for a year or longer.

3. The injections do not provoke anaphylactoid reactions and appear to have relatively little effect on the kidneys and intestine, but they are likely to cause more or less stomatitis, which may flare up suddenly into very severe and fatal forms.

4. The repeated injections that are necessary tend to set up inflammatory reactions in the vein, of such degree as to be seriously objectionable.

5. Intramuscular injections present the same dangers and uncertainties as the intravenous and are markedly irritant.

6. Until the conditions that influence the toxicity are better known and controlled, the risks appear too great to justify the therapeutic use of these injections.

REPORT OF CASES

CASE 1.—P. S., a man, aged 31, had a penile lesion of two days' duration, in which spirochetes were present in large numbers; the blood Wassermann reaction was negative. From January 31 to February 23 eight injections, a total of 2.6 gm. of metallic mercury, were given. The patient had few or no symptoms in the way of elevation of temperature, amnesia, malaise, nitritoid reaction, etc. The white blood count varied from 7,400 to 8,000. Spirochetes disappeared in the lesion in seven days—two days after the third injection. Following the sixth injection, he developed a few hyaline and granular casts with a very faint trace of albumin. He had slight salivation after seven injections, and definite salivation at the end of treatment. The chancre healed in fourteen days, after five injections. It was necessary to give the last three injections in the left arm, as the vein in the right arm had become sclerosed, an obstruction which apparently kept getting slowly worse as treatment went on. This process was quite hard, though it gradually disappeared after four weeks. The patient was then given arsphenamin, as it was not possbile to follow him longer without treatment.

CASE 2.—C. J., a man, aged 19, had a generalized, follicular syphilid with moist papules on the perineum and scrotum. There was cerebrospinal involvement with a cell count of 24; the Wassermann reaction was two plus with 0.1 c.c., three plus with 0.2 c.c., and four plus with higher dilutions of fluid. The globulin reaction was positive. Spirochetes were present in large numbers in the condylomas. The patient was given nine injections, a total of 3.3 gm. of metallic mercury, from January 5 to February 5. The patient's cutaneous lesions reacted very well to therapy and were practically healed after five injections, in fifteen days, while the spirochetes were gone after four days, search being made for them daily. The central nervous system symptoms also reacted well, the cell count dropping from 24 to 5, and the Wassermann reaction to a negative in all doses, Feb. 18, 1924. The patient developed a very moderate salivation after twenty-one days in which he received seven doses, while the urine never showed more than a faint trace of albumin, which began at the same time. There was slight tenderness over the vein used after the first injection and slight induration after the second injection, forcing the use of the other arm. After five injections, both arms were indurated and there was an abscess on the right. From then on we had difficulty with the injections, and a portion of the sclerosed vein from the right arm was excised for examination by the pathology department, which reported that there was an absence of the lining endothelium of the intima. Both the intima and the media were greatly thickened, this thickening being due primarily to a marked proliferation of connective tissue. In part of the intima there was a deposit of black pigment, part of which had a globular appearance; in others, it was fine and granular. There were wide strands of connective tissue throughout the media, and in some portions there was an infiltration of round cells. The vessels of the adventitia were slightly thickened. Under higher magnification, there were also fine granules of pigment scattered throughout the media. There were a few areas of hemorrhage in the media.

The pathologic diagnosis was phlebosclerosis. A phenolsulphonephthalein test, February 9, resulted in the return of 30, 18 and 19 per cent., or 67 per cent.

The result of the treatment was excellent from the clinical standpoint, but bad from that of effect on the veins.

CASE 3.—J. N., a man, aged 30, had a healed primary lesion of four weeks' duration, nicely healed over. Spirochetes were found with great difficulty. He was given nine injections of mercodel, a total of 3.5 gm. of metallic mercury, from January 11 to February 9. The lesion healed after seven injections, while the spirochetes were gone after twenty-four hours, though they had been hard to find. The patient developed a few hyaline casts in the urine after the sixth injection and became very slightly salivated. He showed a progressively stronger Wassermann reaction under treatment, it being three plus on admission and four plus seventeen days later, after five injections of mercodel. He developed a slight sclerosis of the vein used after four injections, which was marked after five injections, and we were forced to use both arms. At the time of the last injection, the veins on the left arm were tender and could be palpated as cords running up to the shoulder. A specimen was removed for examination. The pathologic department reported that the wall was greatly thickened; this thickening was most marked in the intima. The lining endothelium was intact. There was some increase in connective tissue in the media. The thickened intima encroached on the lumen, reducing its size. There were no deposits of blood pigment found.

The pathologic diagnosis was phlebosclerosis. The phenolsulphonephthalein test, February 12, resulted in the return of 45, 20 and 9 per cent., or 74 per cent. There was a good clinical result, but a bad result on the veins.

CASE 4.—J. O., a man, complained of a primary lesion with condylomas on the scrotum and mucous patches in the mouth; there was cerebrospinal involvement, with paralysis of the seventh nerve on the right side. The blood Wassermann reaction was four plus. The spinal fluid Wassermann reaction was negative; the cell count was 12, and the globulin test was positive. He received nine injections of mercodel, a total of 3.35 gm. of metallic mercury, from Jan. 9 to Feb. 5, 1924. The spirochetes disappeared in twenty-four hours. The facial paralysis was somewhat better after two injections and quite cleared up after the ninth injection. The blood Wassermann reaction changed from four plus, January 12, to two plus, February 7, while the cell count on the spinal fluid rose to 20 cells, and we felt it best for the patient to give him arsphenamin. He had only a very moderate salivation after six injections and developed a few hyaline and granular casts at the same time. At the time of the ninth injection he developed a slight diarrhea and cramps in the abdomen for two days. The phenolsulphonephthalein test, February 9, resulted in a return of 55, 18 and 9 per cent., or 82 per cent. We noted a slight infiltration of the vein after the first injection and it was sclerosed after the sixth, so that no further injections could be given in it.

The clinical result was excellent, but there was a poor vein reaction.

CASE 5.—J. K., a man, aged 32, had a flat papular syphilid on the forehead and neck; alopecia syphilitica; leukoderma syphilitica; mucous patches in the mouth, and cerebrospinal involvement with a cell count of 510. The Wassermann

reaction on the spinal fluid in 0.1 c.c. was two plus; in 0.2 c.c., three plus, and four plus in higher dilutions. A test for globulin was positive. The blood Wassermann reaction was four plus. The patient received ten injections of mercodel, a total of 3.85 gm. of metallic mercury, from January 5 to February 5. He developed only a very moderate gingivitis after five injections of the drug, and showed a few hyaline casts and a very faint trace of albumin after six injections. Clinically, the lesions were healed after five injections, and the spirochetes disappeared from the lip lesion after the fourth day and two injections. The spinal fluid Wassermann reaction changed to a negative in all amounts after ten injections, and the cell count dropped from 510 to 53. The blood Wassermann reaction remained three plus. At this time, because of his developing a frank leukoderma syphilitica on the neck, we thought it advisable to administer arsphenamin. Aside from a slight induration noted on his vein after the eighth injection, he had no other symptoms.

There were excellent clinical and serologic results.

Case 6.—F. J., a man, aged 23, had a small papular syphilid of the follicular type. The Wassermann reaction was four plus. The patient received ten injections of mercodel, a total of 3.35 gm. of metallic mercury. The erupton reacted nicely to therapy, being totally cleared up after five injections. At no time did he show any reaction to therapy. The Wassermann reaction at the end of the course was four plus positive. No sclerosis of the vein was noted.

There was an excellent clinical result and there were no deleterious reactions.

Case 7.—P. G., a man, aged 22, had a primary lesion of three weeks' duration, in which spirochetes were present in large numbers. The blood Wassermann reaction was two plus. The patient received nine injections of mercodel, from Feb. 2 to March 1, 1924, a total of 2.95 gm. of metallic mercury. Spirochetes disappeared after three days, and the Wassermann reaction on the blood was negative after nine injections. The patient showed no kidney reaction. He had an edema of the gums after six injections, which went away when the dosage was lowered slightly. There was slight infiltration about the vein on the right arm after the third injection, which later went down entirely. A phenolsulphonephthalein test after the third injection resulted in a return of 48, 15 and 9 per cent., or 72 per cent.

This was an excellent case in which to study the disappearance of spirochetes.

Case 8.—C. T., a man, aged 24, had a primary eruption of three weeks' duration, a bubo. Spirochetes were present in large numbers. The blood Wassermann reaction was four plus. He received six injections of mercodel, a total of 1.95 gm. of metallic mercury, from January 11 to January 29. The spirochetes disappeared after five days, the lesion on the genitalia gradually healing over. After four injections, he began to develop an induration of the vein on the left arm running up toward the shoulder, which became quite tender. The right arm also showed some sclerosis of the vein. Following five injections, the gums were a little tender, and after the sixth injection of 45 c.c. his tongue began suddenly to swell, the gums became swollen, and there was extensive salivation. Along with this, the patient developed a symmetrical, sharply defined maculopapular, circinate eruption on the extremities, resembling an erythema multiforme. The mouth condition became worse with necrosis of the tissues, and numerous secondary Vincent's organisms were found. The patient was treated for mercurial poisoning, but gradually became weaker and weaker, the kidneys showing a heavy trace of albumin, casts and some red cells. There were no bowel symptoms. He died, February 21. Necropsy revealed an ulcerative stomatitis, congestion of the liver, kidneys and spleen, with moderate emphysema of the lungs. Acute mercurial poisoning was followed by death.

Pathologic examination of a section of the vein revealed that a few areas showed absence of the lining endothelium of the intima. The wall was greatly thickened. This thickening involved both the intima and the media. The thickened intima encroached somewhat on the lumen, reducing the size of the lumen. There was a proliferation of the connective tissue throughout the media. In a few areas of the media, there was a slight infiltration of round cells. In a few areas of the intima there were small deposits of black pigment. The vessels of the adventitia showed moderately thick walls.

The pathologic diagnosis was phlebosclerosis.

Case 9.—The patient had a primary lesion of six days' duration. Spirochetes were present in large numbers. The Wassermann reaction was negative. The patient was given one injection of mercodel, 0.2 gm. of metallic mercury, March 7, 1924. The spirochetes progressively disappeared and were gone, March 11, the lesion healing over entirely. The patient was then put on treatment with arsphenamin.

This was an excellent case in which to study the disappearance of the spirochetes.

Case 10.—G. G., a man, aged 32 complained of a primary infection on the genitalia, a large, flat, papular syphilid on the face, with a maculopapular eruption on the body and oral mucous membrane patches. The blood Wassermann reaction was four plus positive. The patient received three injections, a total of 0.75 gm. of metallic mercury, from March 13 to March 20. After the third injection, the patient, without warning, began to develop an edema of the gums, tenderness and bleeding around the teeth, the salivation and edema involving the tongue. These symptoms quickly took the form of a severe necrosis of the entire inside of the mouth. This was accompanied by diarrhea and cramps in the abdomen, with emesis and headache, the urine showing a very heavy trace of albumin, numerous casts and red blood cells. The patient gradually recovered after several weeks.

In this case, acute mercurial poisoning was followed by recovery.

Case 11.—J. D., a man, aged 30, had a fading, generalized roseola syphilitica, alopecia syphilitica and ptosis of the right eyelid. The blood Wassermann reaction was four plus. In the spinal fluid, the globulin test was positive; the cell count was 22; the Wassermann reaction was negative. The patient received four injections; a total of 1.1 gm. of metallic mercury, from March 4 to March 17, at which time he developed a malaise, along with a slight salivation and a definite edema of the tongue and gums. The urine showed some casts and a faint trace of albumin. Treatment was then stopped because of previous experience. Spinal puncture was performed the second time, March 27, the fluid being, unfortunately, bloody. April 11, he developed an iritis and showed beginning patches on the tonsils. There were symptoms eighteen days after the last injection of mercodel. He was then put on arsphenamin, and reacted nicely. There was no local reaction on the vein. The ptosis of the eye and the alopecia had cleared up in part on mercodel before the other therapy was started.

In this case there was recurrence after four injections of mercodel.

Case 12.—A. A., a man, aged 27, suffered from fading roseola syphilitica, with alopecia luetica; there were extensive oral mucous patches, especially in the corners of the mouth, and numerous scrotal lesions. The blood Wassermann reaction was four plus. He received two injections of mercodel, a total of 0.5 gm. of metallic mercury, March 29 and April 2. Two days after the last injection he began to develop a swelling of the gums, marked salivation, and edema of the tongue. There was secondary swelling of the lymph nodes under the jaw. The urine developed a trace of albumin with many casts, which, April 7, became a heavy trace of albumin with numerous casts. The mouth lesions and kidney lesions gradually subsided by April 15, but some of the syphilitic lesions were still present; spirochetes also were present. He was then placed on arsphenamin. There was no local vein reaction.

This patient gave a poor clinical and bacteriologic result from therapy.

Case 13.—H. A., a man, aged 31, had an infection of eight months' duration and received six injections of arsphenamin. The patient showed extensive mucous patches in the throat. The blood Wassermann reaction was four plus. The spinal fluid Wassermann reaction was four plus in all amounts; the cell count was 180. He received four injections of mercodel, a total of 1.1 gm. of metallic mercury, from March 7 to March 20. Following the last injection, which was possibly deposited into the sheath, the patient developed a painful

swelling of the vein, which extended up to the shoulder, and spread out in the veins below the shoulder into a local, one-half palm sized area of inflammation, which developed local heat, swelling and tenderness. The process gradually subsided in four weeks under rest and ice packs. The patient's mucous patches were completely healed after three injections, but he developed a definite gingivitis and salivation four days after the last injection, and, because of his vein condition and the spinal fluid findings, it was not deemed best to deny him arsphenamin therapy further. The cell count on his spinal fluid, March 24, was 120, with the Wassermann reaction still four plus.

This patient gave a moderately good clinical result, but a very severe vein reaction.

CASE 14.—L. M., aged 23, had a primary eruption of three weeks' duration. Dark-field examination showed many spirochetes; the blood Wassermann reaction was two plus. Following one injection of mercodel, 0.2 gm. of metallic mercury, March 1, a sclerosis of the vein developed which was so extensive that the vein could not be used further. Dark-field examination showed the entire disappearance of the organisms after five days. The lesion healed entirely from the one injection. The patient was carefully observed to note the effect of this one treatment. The blood Wassermann reaction was four plus seventeen days later, and we noted the beginning of a maculopapular eruption. He was then started on arsphenamin therapy. The sclerosis of the vein later cleared up.

In this case there was recurrence following one injection of mercodel; there was extensive vein sclerosis from one injection.

CASE 15.—W. H., a man, aged 21, had a primary infection of the anus; a generalized maculopapular eruption, and mucous patches over the genitalia. The blood Wassermann reaction was four plus. Spirochetes were present in large numbers. The patient received three injections of mercodel, a total of 0.75 gm. of metallic mercury, from February 28 to March 7. By this time he had developed such a sclerosis of the vein that we were forced to stop therapy for a time, and so used him to observe the effects of three injections. Spirochetes disappeared in seven days from the primary eruption, and the roseola was gone in four days. The patches and the primary lesion refused to heal, and two weeks after the last injection mucous patches were noted in the throat. The patient was then placed on arsphenamin. The vein condition gradually cleared up. No salivation and no kidney reaction were noted.

In this case there were vein sclerosis and recurrence after three injections of mercodel.

CASE 16.—J. H., a man, aged 23, had an edematous primary eruption of the genitalia; gonorrhea; an annular papular syphilid of the face; a follicular, small, papular syphilid of the trunk, and leukoderma syphilitica. The blood Wassermann reaction was four plus. The patient was given three injections of mercodel, a total of 0.75 gm. of metallic mercury, from March 12 to March 20. Spirochetes disappeared from the chancre in six days. March 24, he developed an extensive edema of the gums and tongue and some salivation. The syphilid had cleared up as well as it would have with arsphenamin. April 8, the salivation was gone, but we did not think it best to use any more mercury. There were no renal or venous reactions from the injections. The blood Wassermann reaction was still four plus. The latter part of April, the penis began to swell again, and spirochetes were found, one month after the last injection of mercodel.

This patient had a good clinical reaction after three injections of mercodel, followed with a recurrence.

CASE 17.—W. B., a man, aged 22, complained of a generalized, small papulofollicular syphilid. The blood Wassermann reaction was four plus. The patient received six injections of mercodel, a total of 1.8 gm. of metallic mercury, from February 16 to March 4. He showed a definite salivation after the sixth injection of the drug, and further therapy was stopped. The clinical result and the reaction were excellent and quite rapid. The blood Wassermann reaction remained four plus. Six weeks after the last treatment the patient developed a mucous patch on the right tonsil and we put him on arsphenamin. The patient developed a gradual venous sclerosis, and after the sixth injection it was doubtful whether another dose of the drug could have been given in the vein, which was sclerosed and could be palpated to the shoulder as a hard, subcutaneous cord. Sclerosis, during the course of the next six weeks, cleared up. There was no renal irritation.

This patient had a good clinical result from six injections of mercodel, with a recurrence six weeks after the last injection.

CASE 18.—L. J., a man, aged 21, had a dime-sized primary lesion of the genitalia of two weeks' duration. Spirochetes were present in small numbers. The patient received three injections of mercodel, a total of 0.75 gm. of metallic mercury, from February 9 to February 16. The primary lesion was entirely healed after two injections. The spirochetes were gone on the sixth day after treatment was started, and one day after the second injection. There was no salivation, renal irritation or venous sclerosis.

An excellent clinical result in chancre from three injections was shown in this case, with a disappearance of spirochetes in six days. We were unable to hold the patient further.

CASE 19.—J. M., a man aged 28, had a lenticular syphilid of the face and neck and a maculopapular eruption on the body. The blood Wassermann reaction was four plus. The patient received four injections of mercodel, a total of 1.1 gm. of metallic mercury, from March 13 to March 25. There was no renal irritation. The patient was definitely salivated after the fourth injection and treatment was stopped. The cutaneous lesions cleared up nicely and quite rapidly.

INTRAMUSCULAR INJECTIONS

CASE 20.—A white man, with four sharply defined pea-sized primaries on the glans, with spirochetes present in all of them, was given an intramuscular injection of mercodel, April 22, 15 c.c., 0.15 gm. of metallic mercury; on April 26, 20 c.c.; April 29, 25 c.c., and May 6, 10 c.c., making a total of 70 c.c., or 0.7 gm., of metallic mercury. The lesions responded rapidly to therapy—they were dried up in four days. The spirochetes had disappeared by the seventh day, and we considered this a very good clinical result. May 3, the patient showed a beginning salivation and slight edema of the gums. By May 9 this had become quite extreme. There was a severe gingivitis; an extreme salivation, and a superimposed Vincent's infection. The process in the mouth went on to necrosis around the gums and back over the right tonsil. The patient's condition remained almost at this level up to June 1, when he began to improve. Roentgenograms taken of the place where the mercodel injections were given in the hips showed a dark, stippled appearance, similar to that shown after mercurial (gray) oil; and, to date, none of the four injections have disappeared, so that the first injection is still present five weeks after it was introduced.

This case gave an excellent clinical result, but there was extreme poisoning from four injections intramuscularly of mercodel. This is a surprisingly rapid mercurialism from the drug, yet it was not all absorbed five weeks after administration.

CASE 21.—J. R., a man, aged 33, suffered from a small papulofollicular syphilid, numerous patches in the mouth, and moist papules over the scrotum. He received, from May 3 to May 13, three injections of mercodel intramuscularly, 10, 15 and 20 c.c., a total of 0.45 gm. of metallic mercury. There seemed to be no improvement in the eruption, and the therapy was changed because he complained bitterly of pain from the injections.

CASE 22.—E. W., a man, aged 19, had a primary lesion of the genitalia, a maculopapular, generalized eruption. A dark-field examination of the primary lesion was negative; the blood Wassermann reaction was four plus positive. The patient was given three injections of mercodel, 20, 25 and 20 c.c., April 29, May 6 and May 13, a total of 0.65 gm. of metallic mercury. May 8, notation was made that the syphilis was more papular than at the time of admission, but showed no benefit from the treatment. There was no salivation. May 16, the eruption had not cleared up under the treatment, nor was there any evidence of salivation. Roentgenograms of the injections showed them still present in the muscles and along the side of the spine in the lumbar region. The patient

showed but little salivation and complained of a generalized malaise and localized pain, so the therapy was discontinued.

This patient showed a poor clinical result in maculopapular syphilis from three injections of mercodel intramuscularly, a total of 65 c.c. of the solution, or 0.65 gm. of metallic mercury.

CASE 23.—C. N., a man, aged 25, had an extensive, generalized maculopapular eruption with grouped bean-sized condylomas in the crural region. Spirochetes were present in large numbers over the condylomas. Because of our experience with Patient 19, we gave him an injection of mercodel, 10 c.c. in the left lumbar muscle, May 10, and 10 c.c. in the buttock, May 17, a total of 0.2 gm. of metallic mercury. Both injections were quite painful. Dark-field examination on the condylomas still showed numerous spirochetes, May 19, nine days after the first injection. The generalized eruption had cleared up partially, but the local process had not decreased so much, though the condylomas were somewhat less moist in character. The patient showed no evidence of salivation; the urine was negative. Roentgen-ray examination showed shadows still present, May 23. Because of our experience with the first patient and because the organisms were still present, we then started him in on arsphenamin.

In four patients treated by the intramuscular route with mercodel, several things are to be noted. The drug seems to be very painful. From this small series of patients it is impossible to predict a rate of absorption, and a patient may become severely salivated within a few days, yet the roentgenograms show the drug still to be present in the muscles, resembling the picture found after the use of mercurial oil. The therapeutic effect of mercodel intramuscularly is not so pronounced.

THE FOOD REQUIREMENTS OF MALNOURISHED INFANTS

WITH A NOTE ON THE USE OF INSULIN *

W. McKIM MARRIOTT, M.D.
ST. LOUIS

My object in this paper is to draw attention to the large food requirements of malnourished infants, and to discuss the means by which these may be met.

It is now generally recognized that a malnourished infant requires more food per unit of body weight than does a normal infant. There are a number of reasons why this is the case. It has been shown by Talbot [1] and others that the basal metabolism, i. e., the heat output per pound of body weight during rest, is greater in infants who are malnourished. Furthermore, the malnourished infant needs more material for growth if normal development is to be ultimately attained. This means that the malnourished infant must receive not only more total calories per pound, but also more of those elements, such as protein and mineral salts, which are essential for the construction of body tissue.

In the light of the foregoing considerations, it would appear that a malnourished infant would require almost as many calories, and as much or more protein and mineral salts, as a normal infant of the same age, but of considerably greater weight. This implies, of course, a much larger intake of food per pound of body weight. It has been our experience that very few malnourished infants do well unless they receive practically the same total amounts of food as normal infants of the same age.

It is usually stated that a normal infant of average weight requires a daily intake of food having a fuel value approximating from 45 to 50 calories per pound of body weight (from 100 to 110 calories per kilogram), and that the amount of whole milk needed to supply the necessary protein and mineral salts approximates 1½ ounces per pound of body weight, daily. In the case of an undernourished infant, we find that, if the infant weighs one half of what he should for his age, the total food requirement is likely to be in the neighborhood of 100 calories per pound (220 calories per kilogram), and the milk requirement somewhere in the neighborhood of 3 ounces per pound of body weight. These are optimal requirements. A malnourished infant may gain slowly on less, but entirely satisfactory results are not often obtained unless the amounts of food indicated are given.

Unfortunately, a malnourished infant has a diminished digestive capacity, and it is not always possible to give such an infant sufficient food to meet his nutritional requirements. Attempts to meet the requirements with the use of ordinary sweet whole milk dilutions or cream mixtures are usually unsuccessful. Any form of feeding whereby the percentages of the different food elements are reduced below the amounts required for the normal infant is predestined to failure, as the feeding of such diluted mixtures in the small total volume taken necessarily results in a food intake below the requirements. Breast milk has a higher caloric value per ounce than most cow's milk formulas; furthermore, it is readily digestible. At times, however, the amount of breast milk that a malnourished infant will take is insufficient to supply the necessary number of calories. Furthermore, the protein content is low for a malnourished infant. The food value of the breast milk may often be increased to advantage by the addition of such a readily digestible carbohydrate as corn syrup, or by the addition of moderate amounts of dried milk. Both of these may be added to the milk without appreciably increasing its volume or decreasing its digestibility.

Cow's milk, acidified with lactic acid, and enriched by the addition of very considerable amounts of difficultly fermentable corn syrup, is also a readily digested food and of high caloric value. A discussion of the latter type of feeding is given elsewhere.[2] As between the methods mentioned, there is relatively little choice, and certainly still other methods of administering a sufficient amount of food may be used. The important point to bear in mind is that no matter what the method used, the total food intake must come up to a certain definite amount.

Some infants fail to gain even when the nutritional requirements mentioned above have been met, and, in these infants, it is necessary to resort to means for increasing the infant's capacity for utilizing food. The most effective means in our experience has been transfusion. It is our practice to give such infants repeated transfusions of matched citrated blood. The amount given at a transfusion is about 1 ounce of blood for each 3 pounds of body weight (20 c.c. per kilogram). Very often an infant will begin to gain following transfusion, even though the feeding is not changed.

Besides oral methods of administration of food, the intravenous method may be used. Glucose can be given intravenously in a 20 per cent. solution, provided the

* From the department of pediatrics, Washington University Medical School, and the St. Louis Children's Hospital.

* Read before the Section on Diseases of Children at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. Talbot, F. B.: Severe Infantile Malnutrition: Energy Metabolism with Report of a New Series of Cases, Am. J. Dis. Child. 22: 358 (Oct.) 1921.

2. Marriott, W. M.: Artificial Feeding of Athreptic Infants, J. A. M. A. 73: 1173 (Oct. 18) 1919. Marriott, W. M., and Davidson, L. T.: Acidified Whole Milk as Routine Infant Food, J. A. M. A. 81: 2007-2009 (Dec. 15) 1923.

injection is given slowly. The amount of the injection should be from one-third to one-half ounce of 20 per cent. solution per pound of body weight (from 20 to 30 c.c. per kilogram). Glucose, given in this way, is only partly utilized; but if insulin is given at the same time, better utilization of the sugar occurs, and a gain in weight of the infant is the result. We were influenced in our decision to use insulin in these cases by the observation that diabetic patients on insulin treatment often gain weight at a phenomenal rate, even when the food intake is not excessive. There would seem to be a good theoretical explanation for this observed fact. The use of insulin in the treatment of malnourished infants has been recommended by others.[3] We have found that the best results were obtained when considerable amounts were given. The method that has proved most successful in our hands has been the intravenous injection of a 20 per cent. solution of glucose containing 15 units of insulin per hundred cubic centimeters. Such a solution has sufficient glucose to "buffer" completely the insulin, and we have observed no bad results. The injections may be given daily over a considerable period, and, in our experience, the results have been uniformly successful. A gain in weight almost invariably occurs, even in the case of infants

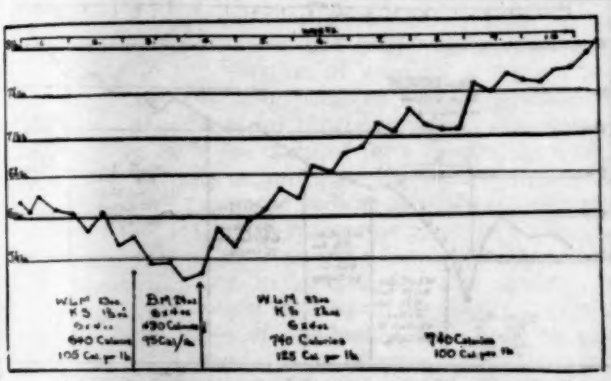

Chart 1.—Weight curve and feeding history in Case 1.

suffering from infections. The weight gained is not subsequently lost when the injections are finally discontinued. We have not used the insulin injection as a routine, but have reserved it for the most extreme cases of malnutrition or athrepsia. In some of the cases, we have felt that, except for this injection, the death of the infant would undoubtedly have occurred within a few days or hours.

REPORT OF CASES

The practical application of the principles outlined above can best be shown by a series of brief case reports.

CASE 1.—Although W. O., aged 5 months, whose weight curve and feeding history appear in Chart 1, had a mild diarrhea on admission, he was not starved; but he was given a concentrated formula consisting of 23 ounces (680 c.c.) of whole lactic acid milk and 1½ ounces (45 c.c.) of corn syrup, six feedings of 4 ounces (120 c.c.) each. The stools became better on this formula, but there was no gain in weight, even though the infant was receiving 105 calories per pound (230 calories per kilogram). Breast milk was given for a few days, but loss of weight continued. It is interesting to note that the breast milk supplied fewer calories than did the lactic acid milk mixture. The feeding was then increased considerably, the formula being 22 ounces (650 c.c.) of whole lactic acid milk with 2½ ounces (75 c.c.) of added corn syrup. This gave a total of 740 calories, or 125 calories per pound (275 calories per kilogram). This amount of food was sufficient, and a steady gain in weight followed. The same formula was kept up for the remaining eight weeks, during which the child remained in the hospital. This case illustrates very well the large caloric requirement sometimes necessary in malnourished infants. It is to be noted that the food requirement of a

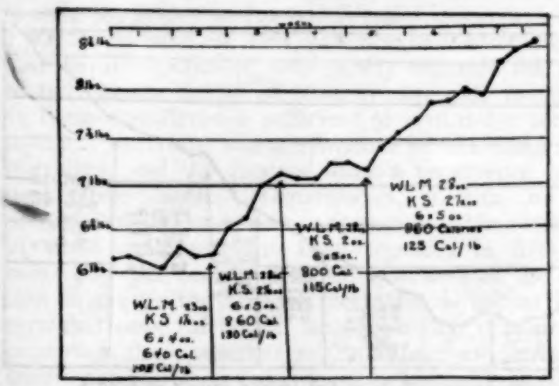

Chart 2.—Weight curve and feeding history in Case 2.

normal infant, 5 months of age, weighing 14 pounds (6.4 kg.), would be 700 calories, on the basis of 50 calories per pound, and this infant failed to gain until he received at least this amount.

CASE 2.—W. K., aged 4 months, weighing 6 pounds (2.7 kg.), was given a formula of whole lactic acid milk and corn syrup, having a total caloric value of 640 (Chart 2). On this formula there was practically no gain in weight. The amount of added sugar (corn syrup) was increased from 1½ to 2½ ounces (45 to 75 c.c.), and this increased the total calories to 860, or 130 calories per pound (286 calories per kilogram). Immediate gain in weight was the result. It was thought that this feeding might be unnecessarily large, so one-half ounce of the sugar was omitted. During the following ten days there was no gain in weight. The extra half ounce of sugar was replaced, and a gain in weight again occurred. The stools were firm throughout the period of observation.

CASE 3.—M. W., aged 3 weeks (Chart 3), was fed on breast milk in fairly large amounts. No gain in weight occurred until a transfusion was given. Chart 3 is self-explanatory. This case is illustrative of the fact that the utilization of food may be improved by increasing the blood volume and, in that way, improving the circulation. Transfusion often brings

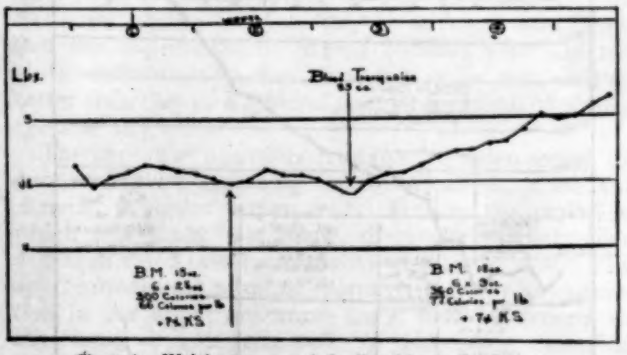

Chart 3.—Weight curve and feeding history in Case 3.

about the same results as are obtained by increasing the amount of food, and should be used whenever feasible.

CASE 4.—B., a premature baby, aged 1 day, weighing 3¾ pounds (1.7 kg.) (Chart 4), was unable to retain more than 1 ounce at a feeding. He was given six feedings of 1 ounce each of breast milk, but lost weight steadily. As a larger volume of food could not be given, the food value of the breast milk was increased by the addition of one-half ounce (15 c.c.) of corn syrup and one-third ounce (10 c.c.) of dried milk. This

3. Pitfield, R. L.: Insulin in Infantile Inanition, New York M. J. 118:217 (Aug. 15) 1923.

almost doubled the caloric intake, and a steady gain in weight resulted. The volume of the feeding was later increased, although the character remained the same. Finally, at the age of 7 weeks, the feedings were changed to whole lactic acid cow's milk with added corn syrup and dried milk. This food was tolerated as well as the breast milk, and the gain in weight continued. This case is of especial interest, as it illustrates the fact that even a premature baby may be safely fed on large amounts of food in concentrated form. This infant received approximately 4 per cent. of fat and as much as 15 per cent. of sugar and over 3.5 per cent. of protein. There were, however, no symptoms of indigestion.

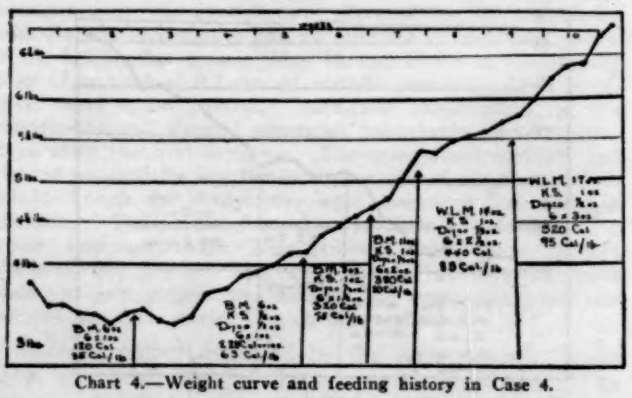

Chart 4.—Weight curve and feeding history in Case 4.

CASE 5.—B. S. was an undernourished infant, weighing 6¼ pounds (2.8 kg.) at the age of 4 months, and had suffered from frequent infections. She was given a large amount of food, as indicated in Chart 5, but without gain. A daily injection of 100 c.c. of 20 per cent. glucose was administered intravenously for six days, and 2 units of insulin given subcutaneously following each glucose injection. Still no gain in weight ensued. The amount of insulin was then increased to 15 units, daily, and this was given intravenously along with the glucose solution. During the next twelve days, the baby gained almost 2 pounds (0.9 kg.). The glucose and insulin injections were then stopped, and the food intake was somewhat increased, as the child's appetite was excellent. The gain in weight, which started during the period of glucose and insulin injections, continued steadily. In this case, the injection of glucose and insulin seemed very definitely to have initiated the improvement.

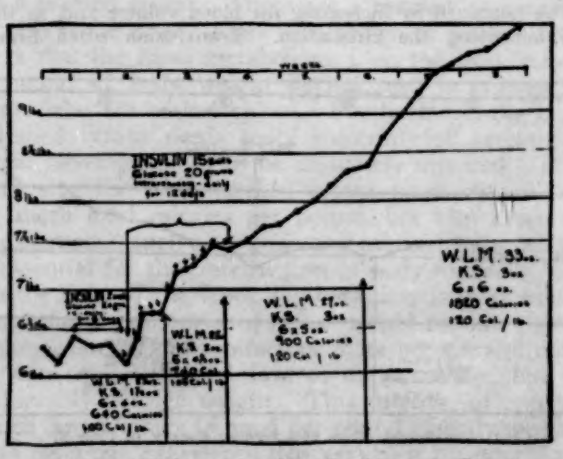

Chart 5.—Weight curve and feeding history in Case 5.

CASE 6.—M. Z., aged 2 months (Chart 6), was a poorly nourished infant, suffering from bronchopneumonia, otitis media and pyelitis. As a result of the infections, the infant developed a severe watery diarrhea, and lost more than 1 pound (0.5 kg.) in weight during a period of three days. It presented the picture of "intoxication." This infant was receiving a skimmed lactic acid milk formula with 1 ounce (30 c.c.) of added corn syrup. The feeding was not discontinued, but glucose and insulin injections were given in the same manner as in the preceding case. The effect of the injections was immediate, and the infant gained 1½ (0.7 kg.) during the next ten days. The feeding was then increased. A continued gain in weight was the result. The infections cleared up, as might be expected, when the nutrition was improved.

CONCLUSIONS

1. The food requirements of malnourished infants are often extremely high, if calculated on the basis of weight.
2. Malnourished infants often require as much total food in the twenty-four hours as normal infants of the same age, but of much greater weight.
3. The large amounts of food required may be safely given, provided the food is of the proper type.
4. The nutrition may be rapidly improved by intravenous injections of glucose and insulin.

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ABSTRACT OF DISCUSSION

DR. JULIUS H. HESS, Chicago: As regards the administration of insulin intravenously in a solution of glucose, I should consider that as an emergency measure when applied other than in a hospital. Even when the undernourished, marasmic infant comes to the hospital, we have to be very careful at first, because we do not know how it will react. Dr. Marriott gives no more insulin than will take care of the glucose put into the vein. I have had no experience with glucose intravenously, but we have had good results with its subcutaneous administration following intravenous administration of glucose. Even that has its risks, however, because infants have a very low blood sugar percentage, and insulin should not be given promiscuously. We must be very conservative in our intravenous therapy or we shall discredit insulin treatment. As to the stomach capacity of the marasmic infant, that is definitely lessened. Martin spoke of this in describing his diet on his recent round the world flying trip, which ended so disastrously for him. Martin and his mechanician lived for ten days on concentrated liquid food. They had three meals a day, allowing only 1 1-2 drams per meal during the last eight days of their wanderings in the arctic region. On the tenth day they reached a cabin and in this they found flour, baking powder and smoked salmon. They thought it would be wonderful to have flap jacks, so they made twelve, expecting that they would be very hungry. They found that the best they could do was to eat two apiece. The stomach capacity was so restricted that they could not take more food. This is also the case in marasmus, and for that reason we have to give small feedings, highly concentrated. The stomach capacity gradually increases under careful dietetic therapy.

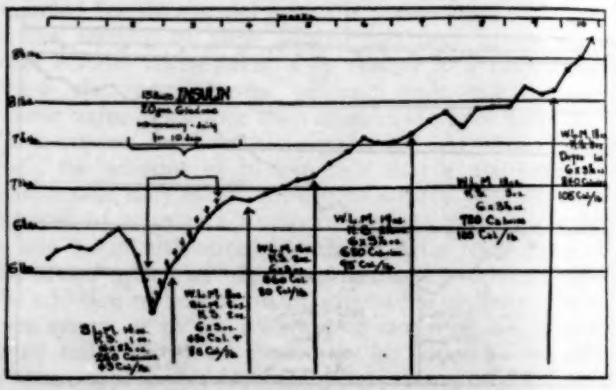

Chart 6.—Weight curve and feeding history in Case 6.

DR. W. M. MARRIOTT, St. Louis: I am glad Dr. Hess sounded a warning against the use of insulin unless well buffered by sugar. Malnourished infants often have a low blood sugar, and if insulin should be given without the administra-

tion of large amounts of sugar at the same time, serious consequences might result. Insulin is given as an emergency measure. The first thing to do with a malnourished infant is to give a transfusion to increase the tolerance for food. Food should then be given enterally, if possible, and intravenously, if this is not possible.

THE CASE AGAINST GASTRO-ENTEROSTOMY *

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ROCHESTER, MINN.

The operation of gastro-enterostomy, since its introduction by Wölfler,[1] in 1881, has proved of such value that no other operation or treatment for lesions of the stomach and duodenum compares with it in general usefulness; and it is doubtful whether any other treatment for any surgical condition has, in the aggregate, afforded so great relief of symptoms. Many types of operation have been devised for the treatment of peptic ulcer, and, while some are efficient in selected cases, not one has attained such widespread popularity as that of gastro-enterostomy. The recent advocacy by distinguished surgeons of Great Britain and Europe of methods more radical than gastro-enterostomy in the treatment of peptic ulcer has raised in the minds of many surgeons the question of whether or not the best possible results are being obtained by such procedures.

Since the only basis for procedures other than gastro-enterostomy lies in the claim of their better end-results, it may be desirable to anticipate the publication of the end-results of these more radical methods by restating the end-results of gastro-enterostomy, at the same time considering its failures and the cause of these, and, finally, outlining the indications for and against the operation. This review is based on the results of gastro-enterostomy in cases of duodenal ulcer only; the consideration of its employment in cases of gastric ulcer and gastric cancer are reserved for a subsequent paper.

The results of gastro-enterostomy for chronic duodenal ulcer are characterized by a striking uniformity in statistics when the operation has been performed on proper indications. In large surgical clinics where gastro-enterostomy is the operation of choice for chronic duodenal ulcer, satisfactory results are reported in from 80 to 90 per cent. of cases. The London surgeon Sherren [2] said recently that, in a series of 500 cases, 92.6 per cent. of the patients were perfectly well two or more years after operation. He also made the important statement that "patients who go for two years without symptoms never develop them later." Enthusiasm for a certain type of operation or treatment occasionally leads to a curious tendency to disregard the results, or to obscure them by including cases in which poor results were the natural sequel to a gastro-enterostomy improperly performed, or made on a stomach innocent of a lesion that would justify any operation.

This report of the results of gastro-enterostomy for duodenal ulcer and its complications is based on reports of the present condition of 1,000 patients on whom the operation had been performed for duodenal ulcer in the Mayo Clinic more than ten years ago. A lapse of ten years is more than a fair basis on which to compute the end-results of any treatment for peptic ulcer, and the reports serve to show not only the degree and permanence of the relief from symptoms, but to what extent the operation protected the patient from subsequent ulceration or its complications.

Pain is the predominating symptom of ulcer, and it is usually the symptom for which relief is sought. In the 1,000 cases studied, 986 patients had complained of pain before operation; only ninety reported the return of pain in any degree of severity, and only twenty-two of these considered it sufficient to return for reexamination. Vomiting was a symptom in 611 cases before operation, and the reports show a recurrence in only twenty-five cases. Hematemesis, melena, or both, occurred in 286 cases before operation. The recurrence of these symptoms has been reported in fifty-seven cases (5.7 per cent.). The effectiveness of the operation in preventing further ulceration is shown by the fact that only thirty-five instances (3.5 per cent.) of recurring ulcer, whether in the duodenum, stomach or stoma, are known to have developed. Experience justifies the assumption that these data represent very closely the incidence of recurrence, since a period of ten years or more would give ample time for reactivation of an old ulcer, or the development of a new one, and for the patient to seek relief by reexamination and treatment. The protection against subsequent perforation is apparently absolute, since not a single case has occurred among these 1,000 patients.

A compilation of the end-results in this series of cases shows that, in 88 per cent. of the patients, relief from the symptoms for which operation was performed has been satisfactory. These patients, moreover, were operated on at a time when little or no effort was made to carry out any hygienic regimen after operation. The patients returned to former habits of living, and, in several instances, disturbance in digestion has been directly attributable to gross indiscretions in diet, or to other excesses. In such a group, therefore, the results of gastro-enterostomy are even more impressive than if the operation had been followed by a reasonable dietary regimen.

One of the most interesting and important facts concerning the results of the surgical treatment of duodenal ulcer was brought out in the investigation by the Actuarial Society of America,[3] in which it was shown that the expectation of life of patients who had had gastro-enterostomies for duodenal ulcer was slightly better than that of a general population group of similar age and sex.

The operative mortality from gastro-enterostomy for duodenal ulcer, including its complications, acute and chronic, is under 2 per cent. During the period in which this study was made, there were twenty-eight deaths in 1,610 cases, a mortality of 1.11 per cent. This approximates the minimal mortality rate for any operation in the upper abdomen, since such operations are associated with definite risks of pulmonary complications superimposed on those incidental to any abdominal operation. There is a pulmonary morbidity of about one in fifty cases of upper abdominal operations, and a mortality of one in 200 directly due to pulmonary complications. Advances in methods of anesthesia, such as the introduction of ethylene, have minimized but not abolished such dangers, and, although gastro-enterostomy carries as low a risk as any other operation

* Read before the Section on Surgery, General and Abdominal, at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. Wölfler, A., quoted by Finney (Footnote 6).
2. Sherren, J.: Disease of the Stomach and Its Surgical Treatment, Lancet 1: 477-481, 1924.
3. Hunter, A.: Gastric and Duodenal Ulcers; Mortality After Operation, New York, Knickerbocker Press, 1919.

in the upper part of the abdomen, the indications for it must take into consideration this small, but definite, operative risk.

FAILURES FROM GASTRO-ENTEROSTOMY IN CASES OF DUODENAL ULCER

In considering the failure of gastro-enterostomy to bring about complete and permanent cure, it is unnecessary to discuss those cases in which the operation should not have been performed. It is always the good thing which is abused, and gastro-enterostomy is still being performed when no ulcer exists or when some other type of operation would be more suitable. As Moynihan says, "Its very success has been against it." In the Mayo Clinic, we have disconnected more than 300 gastro-enterostomies, a large number of which had apparently been unnecessary. Fourteen of these ill advised gastro-enterostomies had been performed in the Mayo Clinic during the early period of gastric surgery.

Exclusive of this group of frankly unnecessary gastro-enterostomies, however, there are many and varied factors that may interfere with the satisfactory recovery of the patient and a good ultimate result. No operation will absolutely insure the patient against minor digestive disturbance later. Moreover, the surgeon should never lose sight of the fact that, in the majority of patients complaining of disturbances in digestion, no lesion of the stomach can be demonstrated, and the symptoms are either functional, or dependent on lesions elsewhere in the body. Failure of gastro-enterostomy to relieve symptoms is usually dependent on one or both of these factors. Functional gastric disturbances are not infrequently associated with the symptoms of chronic duodenal ulcer; and it is not only difficult, in those cases in which an ulcer is known to be present, to differentiate the two syndromes, but it is even more difficult to predict to what extent the healing of the ulcer, by operation, will relieve all the symptoms of which the patient complains. It has been shown by many observers, and it is confirmed in this series of cases, that, in the majority of the few cases in which a satisfactory result is not secured from gastro-enterostomy, the ulcer for which the operation was performed has completely healed, and the cause of the symptoms, whether organic or functional, is found to be extrinsic to the stomach. Failure to detect and deal with lesions elsewhere, particularly lesions that are known to have a causal relationship to peptic ulcer, has been responsible for some of the disappointments. This point is well illustrated by the fact that in the 1,000 cases studied, the majority of the cases in which complete relief from symptoms had not been obtained occurred in the 126 cases in which the appendix had not been removed at operation. The responsibility may also rest with the patients, as they are often tardy in following instructions for the removal of septic foci in the teeth or tonsils, or neglect them altogether. The result of gastro-enterostomy may also be disappointing in cases in which there was, at the time of operation, serious disability from pulmonary or cardiovascular disease; in such cases, the operation may be ill advised.

Failure to recognize or to deal correctly with the more serious complications of ulcer may be followed by unnecessary morbidity or mortality. As an example, there is a group of cases in which disturbances of motor function of the upper gastro-intestinal tract have given rise to severe toxemia, which may go on to gastric tetany, toxic nephritis, and, if not relieved, to death. Such cases, although rare, are most important, since it has been shown that early recognition of the condition is possible by studies in chemistry, and that proper treatment is effective. Such cases have been reported occasionally, and a group observed in the Mayo Clinic has been reported by Brown, Eusterman, Hartman and Rowntree.[4]

McVicar[5] has recently summarized thirty cases of this type, particularly from the standpoint of the clinical and laboratory findings, and the part blood chemistry plays in diagnosis, prognosis and treatment. The important points are: (1) a clinical picture of vomiting; evidences of dehydration; tetany-like manifestations, and features of shock and uremia, and (2) changes in blood chemistry, including: (*a*) high nonprotein nitrogen content (blood urea); (*b*) low chlorids, and (*c*) a high carbon dioxid combining power of the plasma and an invariable tendency toward alkalosis. The administration of alkalis under such circumstances is clearly contraindicated, and successful treatment is based on systematic gastric lavage and the administration of water, glucose, and particularly sodium chlorid. The effect of such treatment is most striking, and it is a distinct advance in the management of cases preoperatively and postoperatively.

Among the other more important causes of a disappointing result are: (1) a young patient; (2) a short and atypical history; (3) the "constitutional inferiority" type of individual; (4) a small ulcer without obstruction; (5) development of pathologic conditions extrinsic to the stomach, giving rise to reflex gastric syndromes; (6) bad habits of living, and (7) unremoved foci of infection. Imperfect results may also depend on errors in technic or judgment in connection with the operation itself, for example, failure to remove the ulcer when removal is indicated; too short or too long a loop; the management of adhesions of the proximal loop to the mesocolon; too small an opening or one not properly placed, failure to close the mesocolon snugly around the stomach at a sufficient distance from the gastro-enterostomy; twists in the anastomotic loop, and unnecessary trauma. Although these possible causes of failure are numerous, they are largely avoidable; and, since excellent results have followed gastro-enterostomy when many of these causes of failure were not avoided, even better results will follow when they are avoided.

AVOIDANCE OF FAILURES

The first and most important rule for the avoidance of failure is to be certain that proper indications for the operation exist. The ulcer must be demonstrable by inspection or, if on the posterior wall, either by palpation or by direct inspection through an opening in the anterior wall of the stomach or duodenum, or both. In cases in which a diagnosis of ulcer has been made by a competent roentgenologist, and the surgeon is unable to demonstrate an ulcer by inspection or palpation, it is necessary to explore the duodenum from within, since, in certain cases, a hidden ulcer of the posterior wall can be detected only by visualization. There is no doubt that these posterior ulcers are much more common than we have believed; they are usually associated with a scar on the anterior wall, which is the only lesion recognized. The more extensive the lesion, the wider the extraduodenal inflammatory changes; the more marked

4. Brown, G. E.; Eusterman, G. B.; Hartman, H. R., and Rowntree, L. G.: Toxic Nephritis in Pyloric and Duodenal Obstruction; Renal Insufficiency Complicating Gastric Tetany, Arch. Int. Med. **32**: 425-455 (Sept.) 1923.

5. McVicar, C. S.: A Discussion of the Clinical and Laboratory Findings in Certain Cases of Obstruction in the Upper Gastro-Intestinal Tract: The Rôle of Blood Chemistry in Diagnosis, Prognosis, and Treatment of This Condition, Am. J. Med. Sc., to be published.

the obstruction, the higher the gastric acidity; the longer the duration of symptoms, and the greater the disability of the patient, the more definite are the indications for gastro-enterostomy, and the more certain its results. It is a curious anomaly that in cases of chronic duodenal ulcer, late operation is followed by better results than early operation. Accordingly, the results are not so certain if a patient has had mild symptoms of short duration, low acids, and a small uncomplicated lesion, and if the stomach is small. Such cases, from a technical point of view, are satisfactory for local excision of the lesion, with or without pyloroplasty; but experience in the Mayo Clinic has shown that the end-results with these procedures are not definitely better than with gastro-enterostomy. A higher percentage of satisfactory end-results could be obtained in these cases if surgical treatment were postponed until the indications for it became more definite.

There is, therefore, an optimal time for operation for duodenal ulcer. In the majority of cases, it is when the patient is first seen by the surgeon and the diagnosis made. When certain complications exist, however, a more favorable time may be selected. Hemorrhage from ulcer rarely, of itself, justifies an emergency operation, and surgical treatment should be deferred until the patient recovers from the effects of the hemorrhage. If a secondary hemorrhage occurs, however, a transfusion should be performed and the operation carried out immediately. Whatever risk is associated with such treatment is justifiable, since a secondary hemorrhage in such cases usually presages a third, and the ultimate death of the patient from further recurrences. The toxemia of obstruction, the necessity for its early recognition, and the value of preoperative preparation have been mentioned.

The second rule is that the operation shall be performed properly. Of the many important details in the performance of gastro-enterostomy, the following may be emphasized:

1. A large opening should be made at the most dependent part of the stomach. The importance of a large anastomosis cannot be overestimated. As the ulcer heals under the effect of the gastro-enterostomy, the pyloric spasm is relieved; the pylorus functions more readily, and there is a tendency for the new stoma to contract. This may reach a point at which it does not serve a real purpose, and there may be a reversion to the same condition that was present before the gastro-enterostomy was performed, with a possible reactivation of ulceration. The opening should be large enough, therefore, to anticipate such contraction. If a small stomach, adhesions or an anatomic anomaly do not permit a large opening, and the duodenum can be mobilized so that a satisfactorily large pyloroplasty or gastroduodenostomy can be performed, the latter may be employed. Anterior gastro-enterostomy, particularly when combined with entero-anastomosis, is a more useful substitute for posterior gastro-enterostomy than is generally believed.

2. The proximal loop of jejunum should not be too short. A malfunctioning gastro-enterostomy may be due to a proximal loop so taut that when contraction of the stomach occurs, the anastomosis is twisted by rotation of the stomach, with sufficient jejunal kinking to produce an obstruction of either afferent or efferent loops, or both.

3. The segment of stomach surrounding the anastomosis should funnel on all sides to a distance of at least 2.5 cm. below the opening in the mesocolon, and the edges of the latter structure should be sutured snugly to the stomach, particularly in those cases in which there is an excess of fat in the mesocolon.

PROTECTION AGAINST SUBSEQUENT HEMORRHAGE

Hemorrhage following gastro-enterostomy may be immediate or remote. Serious hemorrhage from the anastomosis must be regarded as a technical blunder for which the surgeon assumes responsibility. Hemostasis can be made as certain in a gastro-enterostomy as in any other surgical procedure. If the suture line has been made secure in this respect and gross hemorrhage occurs postoperatively, it is due either to an unremoved ulcer or to causes extrinsic to the stomach. The incidence of hemorrhage from unremoved ulcer during the immediate convalescence of the patient is so small that no special measure carried out as a routine is warranted to prevent its occurrence; but, whenever the ulcer is reasonably accessible, it should be removed.

Hemorrhages remotely subsequent to operation may be due to: reactivation of the original ulcer; an overlooked ulcer; a new ulcer in the duodenum, stomach or stoma, or causes extrinsic to the stomach. Careful examination of the patient will usually reveal the cause of these hemorrhages, and surgical treatment will satisfactorily deal with it, whether it be a lesion of the stomach, duodenum or stoma; a diseased appendix, gallbladder or spleen, or some infectious focus, particularly in the teeth or tonsils. Hemorrhages may rarely recur persistently; however, when every recognizable cause has been eradicated, such hemorrhages have usually been due to hepatic cirrhosis.

RECURRENCE OF ULCER AFTER GASTRO-ENTEROSTOMY

The recurrence of ulcer after gastro-enterostomy or, in fact, after any type of operation is apparently directly associated with failure to reduce the acidity, to maintain this reduction, and to provide adequate drainage. Sherren has recently reported a series of cases which strikingly illustrate this fact. He made notes concerning preoperative and postoperative test meals in 285 cases of chronic duodenal ulcer; thirty-seven showed little or no reduction in gastric acidity, and in all except eleven of these, he had made a special note of some abnormality, the most common being adhesion to the gallbladder or liver (seventeen cases), the opening nearer the pylorus than usual (three cases), the opening smaller than usual (two cases), antecolic operation (one case), and bruising around the anastomosis clamp (three cases). In seventeen of the thirty-seven cases, further symptoms developed; five of the patients had gastrojejunal ulcers. In 131 cases, free hydrochloric acid was absent, and the total acidity low. In none of these cases has there been a return of symptoms. There are also sixty-five cases in which there was great reduction of free hydrochloric acid, but not total abolition. The end-results in these are perfectly satisfactory. There were fifty-two cases in which the acidity was reduced to normal, and, while most of the patients remain quite well, symptoms persisted in five. None, however, developed jejunal ulcer. This is unmistakable evidence that the production of ulcers is intimately associated with the factor of gastric acidity.

If the results of gastro-enterostomy in chronic duodenal ulcer are summarized, as reported ten or more years after operation, it will be found that 88 per cent. of patients have obtained satisfactory results, based on the relief of the symptoms caused by the ulcer, and that

the 12 per cent. of incomplete results include 3.5 per cent. recurrence of ulcer, 5 per cent. recurrence of hemorrhage, and 3.5 per cent. with no improvement. Such recurrences and failure to relieve symptoms can be largely prevented by improved preoperative, operative and postoperative management, and when they do occur, can be controlled or corrected by appropriate treatment or secondary operation. In this series of 1,000 cases, there were fifty-six secondary operations, 90 per cent. of which were performed at the Mayo Clinic. Thirty-two of the secondary operations were for recurrence of ulcer (twenty-two of which were in the gastro-enterostomy, seven in the duodenum, and three in the stomach). I believe that a partial gastrectomy is justifiable at the second operation in such cases. If it could have been known that these patients had an unusual tendency to ulcer formation, such a procedure might have been advisable at the time of the first operation.

The important question is whether any other type of operation, if given sufficient trial, would lessen this small incidence of recurrence and failure to relieve symptoms completely. While there is undoubtedly a place in the surgical treatment of duodenal ulcer for the various types of pyloroplasty, or gastroduodenostomy, particularly that of Finney,[6] C. H. Mayo[7] or Horsley[8] for local excision alone, or for the various types of gastrectomy, experience at the Mayo Clinic has shown that the indications are limited. For chronic duodenal ulcer, there have been performed in the Mayo Clinic, during the last nineteen years, 5,755 gastro-enterostomies, 296 local excisions with or without pyloroplasty or gastroduodenostomy, and forty-three resections. None of these operations will give absolute assurance against recurrence of ulcer or hemorrhage, or persistence of symptoms due to the original causes underlying the complaint, which may be nervous or reflex. The present enthusiasm of some surgeons for partial gastrectomy for duodenal ulcer is based on the belief that better end-results are assured by this operation, and, in a general way, the value of any operation for duodenal ulcer lies in its power to reduce the acidity of the stomach and maintain this reduction. Theoretically, the removal of the ulcer-bearing portion of the stomach should prevent ulcer recurrence; but, practically, this is not certain. Finsterer[9] reports six cases in which ulcer had recurred after partial gastrectomy, and, in the belief that not enough stomach had been removed, he resected another portion. It remains to be seen what the symptomatic results will be when enough stomach is removed to reduce the gastric acidity so low. Patients with achlorhydria frequently present a definite syndrome of gastric symptoms, and these symptoms may be more disabling than the symptoms for which the gastrectomy was performed. While the relation between hyperacidity and ulcer is not invariable, since well developed ulcers may exist (with achlorhydria), the fact remains that persistent hyperacidity is one of the most prominent features of peptic ulcer.

SUMMARY

At the present time, therefore, there is no conclusive evidence that any operation is more useful than gastro-enterostomy in cases of chronic duodenal ulcer, except in carefully selected cases. Although partial gastrectomy may be indicated in cases in which there is a persistent recurrence of the ulcer after gastro-enterostomy, since this recurrence is certainly not over 3 per cent., it would be difficult to justify partial gastrectomy in 100 cases of nonmalignant disease in order to prevent such a small percentage of recurrence, particularly when such recurrence can be satisfactorily dealt with by secondary operation. Gastro-enterostomy is not destructive. The operation, in suitable cases, can be depended on to give excellent and permanent results in more than 90 per cent. of the cases; and it has a distinct advantage over all other operations for peptic ulcer in that after the ulcer has completely healed, the anastomosis may be disconnected with ease and safety, if desired.

6. Finney, J. M. T.: A New Method of Pyloroplasty, Bull. Johns Hopkins Hosp. **13**: 155-161, 1902.
7. Mayo, C. H.: Gastroduodenostomy: Its Indications, Surg., Gynec. & Obst. **38**: 583-587 (May) 1924.
8. Horsley, J. S.: A New Operation for Duodenal and Gastric Ulcer, J. A. M. A. **72**: 575-583 (Aug. 23) 1919.
9. Finsterer, H.: Local Anesthesia Methods and Results in Abdominal Surgery, New York, Rebman Company, 1923.

ABSTRACT OF DISCUSSION

DR. J. SHELTON HORSLEY, Richmond, Va.: The excellent results reported by Dr. Balfour following gastro-enterostomy for duodenal ulcer demonstrate that this operation is exceedingly effective in a large proportion of such cases. When there is an actual stenosis by scar tissue, or when there is an extensive infiltrating ulcer of the duodenum which forms a potential stenosis, a properly performed gastro-enterostomy gives as satisfactory end-results as can be desired. Gastro-enterostomy in gastric ulcer is not so satisfactory, and in cancer the relief is quite limited. It would be interesting to have some classification of the types of duodenal lesions in which Dr. Balfour's series of gastro-enterostomies have been performed. If they could be divided into (1) cicatricial stenosis; (2) extensive duodenal ulcers with potential stenosis; (3) small duodenal ulcers with adhesions, and (4) small, limited duodenal ulcers without adhesions, we should have a most interesting group. In the first two classes the end-results of gastro-enterostomy are always good. It is in the class of cases of limited small duodenal ulcer with no adhesions or with adhesions only to the gallbladder that gastro-enterostomy seems to be most unsatisfactory. As the total series of gastro-enterostomies for duodenal ulcer dates back more than ten years, we may assume that the lesions in those days were somewhat more advanced and that there was a larger proportion of the first two classes of cases than there would be now, because the refinement of diagnosis and the attention that has been called to this lesion probably bring earlier cases. The less extensive the pathologic changes in the duodenum, the stronger the indication for pyloroplasty. After excision of ulcers in the body of the stomach, pyloroplasty is an excellent operation to relieve the physiologic obstruction to the emptying of a stomach that has been temporarily crippled by the operation, and pyloroplasty leaves no undesirable after-effects, as a gastro-enterostomy with an open pylorus may leave. Pylorectomy, the cautery treatment of Balfour, and midgastric excision of the stomach all have a very definite field in the surgical therapy of gastric ulcers. In the pyloroplasty that I have been doing, I have found that in nearly 10 per cent. of the cases there is a recurrent ulcer along the suture line. Doubtless this proportion is no greater than would be jejunal ulcers after gastro-enterostomy with a wide open pylorus. The work of Dragstedt, in showing that the most effective way of producing a chronic ulcer in the pyloric end of the stomach in a dog is to place a number of sutures in the mucosa, is very suggestive. I have changed the technic of pyloroplasty, and now do not suture the gastric mucosa at all. The innermost row of sutures is omitted. The gastric mucosa is protected from injury, even from the grasping of forceps, as much as possible. As to the acidity, Dragstedt recently reported experiments which suggest that ulcers are apparently not due to high acidity but that the high acidity is due to the ulcer. That corresponds with well known facts.

DR. B. W. SIPPY, Chicago: Every one familiar with the effect of gastro-enterostomy performed for duodenal ulcer that is causing pyloric obstruction recognizes that, if the patient survives, the symptoms are likely to disappear at once and do not return in a large percentage of cases. We all

know that the mortality of the operation ranges from 1 or 2 to 100 per cent., depending on the skill of the operator. We have just listened to the report of supersurgeons giving a mortality of 2 per cent. or slightly less and a return of symptoms in 12 per cent. In what manner does gastro-enterostomy bring about its beneficial results? Very clearly, the ulcer is not removed at the time of the operation. If it ceases to exist, it must do so by undergoing a definite healing process. It is very generally understood that the relief from symptoms, the apparent and real cures following gastro-enterostomy when performed for pyloric obstructive ulcer, are due chiefly to the hastened emptying of the stomach, thereby lessening the duration of contact of the irritating digestive gastric juice with the ulcer. Years ago it was believed that after gastro-enterostomy the stomach drained itself virtually immediately. We now know that a gastro-enterostomized stomach continues to empty itself through the pyloric outlet in proportion to the size of the opening through it, and that it does not empty itself of food and secretion appreciably quicker than the normal stomach. The beneficial influence on healing is proportional to the degree of obstruction. After gastro-enterostomy performed for high grade pyloric obstruction, a twenty-four hour contact of gastric juice with the ulcer is reduced to twelve or fourteen hours each day. The ulcer at the outlet is thereby placed in approximately the same conditions for healing as the nonobstructive duodenal or gastric ulcer without treatment. Unquestionably, in many instances ulcers develop in the stomach and duodenum and heal spontaneously. In our service we seldom have less than two or three, and have had as many as eleven gastro-enterostomized patients with recurrent ulcer under treatment in the hospital. Delayed emptying and excessive continued secretion are among the common conditions associated with recurrences after gastro-enterostomy. If the commonly accepted conception of peptic ulcer is correct, namely, that under certain conditions peptic gastric juice constitutes the greatest hindrance to the healing of ulcer that is amenable to medical or surgical control, then it must follow that the maximum healing effect of any type of treatment cannot be brought about without incorporating in it an accurate neutralization of the free hydrochloric acidity, thus completely annulling the irritating and peptic properties of the gastric juice.

DR. ALFRED A. STRAUSS, Chicago: The evidence Dr. Balfour has given us of the efficacy of gastro-enterostomy is so overwhelming as to be almost unquestionable. There are, however, clinics that do not report such a high percentage of excellent results from gastro-enterostomies. For instance, recently in Schmieden's clinic in Germany, out of 250 gastro-enterostomies 50 per cent. were found to be failures. I believe, and I am sure Dr. Balfour will agree, that the ideal principle for stomach surgery is, first, to remove the pathologic condition, and, secondly, to do an operation after which the stomach will empty in normal or quicker than normal emptying time. Gastro-enterostomy will allow a normal or quicker than normal emptying time; but it does not remove the pathologic condition or the lower half of the stomach, which is in constant spasm as a result of the pathologic condition in the duodenum; hence, there is a recurrence of symptoms. We have adopted a resection of the first portion of the duodenum, dissecting away the pancreas, taking the lower half of the stomach and doing a Polya or Polya-Balfour operation. In such cases, we find a 3 per cent. mortality (mostly from post-operative pneumonias) which, compared with the mortality of gastro-enterostomy plus the cases in which there has to be reoperation following gastro-enterostomy, is about the same. It must also be admitted, even by the advocates of gastro-enterostomy, that the clinical end-results are much superior and much more permanent by the radical resection method. From resecting the first portion of the duodenum, we find that from 35 to 40 per cent. of our cases are posterior wall duodenal ulcers penetrating into the pancreas, a good portion of the duodenal wall having sloughed away. These cases will continue to give symptoms after gastro-enterostomy, and many result in gastrojejunal ulcers. In such cases I believe it better to leave the patient in the hands of the medical man than to do an operation which is only a makeshift and which will have to be followed by a second operation. By resection I believe that we produce a much more permanent cure. As to the pathologic changes, we find in serial sections of the duodenum that it is infiltrated with lymphocytes, eosinophils, plasma cells and scars of healed ulcers. We are therefore dealing with a duodenitis in addition to the ulcers. For this reason I believe that, if the mortality can be kept around 2 or 3 per cent., the essential method is to remove the pathologic condition, and then do an operation so that the stomach or duodenum empties in normal or quicker than normal time, such as a radical resection, which gives better clinical end-results than gastro-enterostomy.

DR. ROBERT T. MORRIS, New York: The report on cases of recurrence is not complete unless we have in addition reported on something besides the mechanistic surgical features. These patients are largely patients who are sensitized to certain toxins. They have a morbid sensitization of the endoderm of the midgut. We will find in many cases of recurrence that no competent steps have been taken medically to change the immunity cycle, and no search has been made for foci of infection in teeth or tonsils or other causes for disturbance of the hormone secretion of the stomach. It seems to me that we are not accepting freely enough Rosenow's idea of elective affinity for toxins in these cases. In my experience most of these patients who come back for operation are the patients who have not had any exhaustive search made for foci of infection or for peripheral irritation factors, eye strain, loose kidney or nasal defects, for example, causes leading to disturbed hormone secretion. In cases of recurrence, then, any report is incomplete unless we have this collateral testimony presented showing that the original causes for ulcer have been disposed of in the cases.

DR. CHARLES H. MAYO, Rochester, Minn.: This paper has been timely on account of the failures that are resulting from various operations on the stomach, possibly because gastro-enterostomies are made in an effort to relieve the symptoms incident to supposed ulcer on the posterior wall, and not looked for by the operator. If gastro-enterostomies are performed when no ulcers exist, they separate later. The point that gastro-enterostomy relieves symptoms with a small risk, if there is a real indication for it, is of interest; however, it takes both a medical man and a surgeon to deal with these cases properly. Dr. Will used to say, in reference to the recurrences, that a surgeon should never operate on a patient with ulcer of the stomach until he had had nine complete and permanent cures through medical treatment. There is, however, no question but that ulcers of the stomach do heal. Careful post-mortem examination to ascertain the cause of death will reveal a great many beautifully healed scars in the duodenum and stomach of patients who presented no evidence of ulcers during life. It can be shown by proper tests that certain persons have hypersensitive stomachs, and others hyposensitive. I congratulate Dr. Sippy on his results in treating these cases. Since many gastric and duodenal ulcers heal without the knowledge of either patient or physician, it is quite probable that many heal under treatment. The advisability of wide excision in these cases is certainly open to question. I have in mind Finsterer's operation, which he demonstrated here a year ago. If I had an ulcer of the duodenum I should not permit any one to remove half of my normal stomach in order to cure the duodenal ulcer. I believe that we must exert ourselves to bring about cure or relief of unfortunate conditions that have been shown to be secondary to ulcers of the stomach; but ulcers of the duodenum do not become malignant. Occasionally a Billroth I operation should be performed for extensive local disease with mechanical obstruction. If patients are suffering from an ulcer of the duodenum, and the lower 2 inches of the pyloric end of the stomach is removed, there will certainly be a loss of hormones, which will influence the acids, and the patients will be unable to eat meat or egg albumin unless they take medicine with their food. It will be found that many patients with greatly dilated duodenums have gastric neurosis and various other complaints that will remain with them all their lives. Usually they have no acids in the stomach, and there is a reversal of the duodenal alkalis back into the stomach. A gastro-enterostomy will not relieve them, and the condition may go on to gastric tetany. Relief from the obstruction of the lower end of the duodenum into the

jejunum is needed. Typical pyloric ulcers are produced in animals by dividing the pylorus, turning in the duodenal end; sectioning the jejunum, anastomosing the distal end to the stomach, and draining the proximal end into the ileum. In the majority of cases, ulcer of the jejunum develops. In the same dogs in which ulcers have been produced mechanically and biochemically, it will be found that the type of streptococci that locate in ulcers will produce ulcers under proper conditions. If these ulcers of the duodenum are tested, the same type of streptococci will be found that occur in the human patient.

DR. WILLARD BARTLETT, St. Louis: It seems to me that the upshot of this whole thing is that we are confronted with a condition rather than with a theory. All of us who have done only a few gastro-enterostomies, not having learned to do them very well, have cases that are classed as unsatisfactory operations. All the men who have spoken are men whose opinions are valuable and who have been doing the right thing, I believe, but they have not done the operation on 1,000 patients and reported the results ten years later; so I say that we are confronted in those opinions with theories, while in the operating room we are confronted by a very definite condition; and when we are confronted with that condition tomorrow or next week, we should remember that the only man at this time who is doing surgery of the stomach on a very large scale has reported 1,000 cases, the patients having all been operated on more than ten years ago with a percentage of mortality and morbidity as low as or lower than those reported by the rest of us with more limited experience with another method. I believe that your duty will seem obviously clear under the circumstances; at least, mine will.

DR. W. D. HAGGARD, Nashville, Tenn.: Extensive resection of the stomach as practiced in Germany is not going to be adopted in America. We had the pleasure of having Professor Finsterer at Vanderbilt. We admired his skill, but were amazed at his courage. It seemed extravagant to remove such a large portion of a healthy stomach for duodenal ulcer and then supplement that operation with a cholecystectomy and appendectomy at the same time. Moreover, some surgeons have been so impressed with the character of this operation, and it has so appealed to them as far as the technical surgical gymnastics have been concerned, that they remove the right half of the stomach when they want to get at a duodenal ulcer that was adherent to the pancreas and could not be removed. One third of the stomach was removed, but the duodenal ulcer for which the operation was done had to be left. As far as end-results are concerned, they have been extremely satisfactory with gastro-enterostomy. I am gratified to find that Dr. Balfour and his colleagues have done twenty-five gastro-enterostomies to one resection. I felt, in analyzing 100 cases of duodenal ulcer with only two resections, that we were old fashioned and behind the times; but I now see that my own attitude has had very strong support. I was astonished, in the analysis of these 100 cases, that 22 per cent. had perforated, and I was greatly chagrined that the mortality was 40 per cent. in cases of perforation. I might say in explanation that the great majority of these cases had passed ten, twelve, fourteen and even twenty-eight hours, so that practically no patients in our series were saved after eight hours. In some of the cases of duodenal ulcer in the medical service, perforation occurred in the hospital, and in one case in which we proposed a gastro-enterostomy three years before, and it was declined, the patient returned because of extensive hemorrhage. We performed transfusion preparatory to operating. After a few days he had a fatal hemorrhage while awaiting operation.

DR. DONALD C. BALFOUR, Rochester, Minn.: I should like to emphasize what Dr. Morris said about the patients who come back with recurrences. If a diligent enough search is made, it will often be found that the cause or causes that originally were responsible for the ulcer are still there. In this connection, it is significant that, in the 1,000 cases studied, many of the patients who had a recurrence of symptoms were found to be in a group of 126 from whom the appendix had not been removed. My real purpose in presenting this paper is to place on record the end-results of gastro-enterostomy in duodenal ulcer, so that when the end-results of radical resection and other types of operation are reported, this record will be of some value for comparative purposes. Both Dr. Mayo and Dr. Haggard referred to the question of partial gastrectomy for peptic ulcer. This operation is often indicated for gastric ulcer; but it is rather difficult to justify such an extensive operation for a high-lying small ulcer of the lesser curvature, since excellent results can be obtained by local excision and gastro-enterostomy. It would be still more difficult to justify partial gastrectomy for duodenal ulcer, since gastro-enterostomy will give good results in more than 90 per cent. of the cases.

COMPARATIVE METHODS OF PROTEIN EXTRACTION WITH CHEMICAL AND CLINICAL STUDIES *

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Protein skin tests are a generally accepted method of diagnosis in allergic diseases. It is known that they furnish reliable evidence in determining the etiologic factors concerned in allergic manifestations. This reliability is based on evidence that may be demonstrated both clinically and experimentally. On the clinical side, we know that typical skin or systemic reactions are more or less constant for each specific protein in a given sensitive individual, that removal of this protein relieves the allergic symptoms, and that by small, graduated doses it is possible to immunize a sensitive individual against this protein's injurious effects. On the laboratory and experimental side, we know that many proteins give a precipitin or a complement fixation test with the serum of the individual in whom they produce allergic symptoms; that it is possible to sensitize a hitherto nonsensitive individual to a given protein, and that there is an analogous and, in almost every way, similar train of evidence obtainable in experimental animals as demonstrated in the production of anaphylactic shock. This, then, summarizes the evidence on which is based the general acceptance of the protein skin tests.

Throughout the vast amount of scientific work that has been done to make possible the foregoing dogmatic statements, the assumption has arisen that proteins and only proteins are capable of producing anaphylactic or allergic reactions. Indissolubly bound up with this assumption is that of the specificity of immunologic phenomena. One cannot be discussed without the other. In general, they must be accepted, yet evidence is constantly being gathered attacking their fundamental basis. Thus, Manwaring [1] has been able to produce an anaphylactic reaction in a guinea-pig lung with Vaughan's split protein; Wells [2] speaks of the specificity of lipoid substances, and recently Landsteiner [3] has produced anaphylaxis by sensitizing an animal to one protein containing an azo group, and using as the anaphylactc dose another protein to which the same azo group had been attached. Moreover, peptone shock

* Read before the Section on Pharmacology and Therapeutics at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. Manwaring, W. H., and Marine, H. D.: I, Reactions to Histamine and Vaughan's Protein Split Product, J. Immunol. 8: 317 (July) 1923.
2. Wells, H. G.: Chemical Pathology, 1922.
3. Landsteiner, K.: Experiments on Anaphylaxis to Azoproteins, J. Exper. Med. 39: 631 (May) 1924.

and nonspecific protein shock, questioning in the one instance the protein basis and in the other the protein specificity of immunologic phenomena, have long been known. Add to this our inability to produce a single protein of constant chemical composition, and we have sufficient evidence of the incompleteness of our knowledge of proteins.

We believe that a further study of the chemical nature of protein, checked up with clinical observations, will throw considerable light on what is as yet an obscure subject. In all the work on allergy, the first unknown factor is the protein, the basic tool with which we work. Not only is its nature unknown, but the methods of obtaining proteins in the great majority of cases are based, to a great extent, on purely empiric grounds. The substances obtained by various methods of extraction are called proteins: they produce skin reactions; they produce constitutional reactions, and, in the laboratory and on experimental animals, they pass the criticism of producing those reactions which we have learned to recognize as criteria of immunity or the lack of it. Numerous methods are used to extract these substances. Yet, so far as we know, no systematic study has been made with the greater number of the proteins used in protein skin tests to determine whether we are here dealing with one or many proteins, or whether, in fact, we are dealing with proteins at all.

In an attempt to attack this problem rationally, we have undertaken some elementary studies in the use of different solvents for the extraction of these substances. As stated, many methods have been described by Goodale,[4] Coca [5] and others, for dissolving out these substances from the animal danders, foods and pollens, with the specific idea of using them for protein skin tests. The production of dry proteins for this purpose, using water and physiologic sodium chlorid solution as extractives, has been described by Wodehouse,[6] Osborne,[7] Mendel and Harris have described methods for extracting proteins from cereals, and Wells and Osborne [8] for extracting proteins from vegetables. Methods for obtaining the various proteins of eggs and milk have long been known, the products so obtained have been found satisfactory in their application as antigens for the protein skin tests.

This paper is a preliminary report. We have not attempted to cover the general subject of extraction of all substances responsible for allergic skin reactions, but have studied the extraction of foodstuffs and animal epidermal structures. No consideration has been given to the extraction of pollens or of bacterial preparations. The task of securing suitably sensitive persons who are willing to be repeatedly tested, together with the difficulty of securing uniformly consistent skin reactions on a given individual, causes our problem to be complex, thus adding to the difficulty of obtaining sufficient evidence on the subject to be conclusive.

So far as the character of the substances causing the allergic skin reactions are known, they are an intimate part of the protein molecule. For this reason, solvents were used in this work that would be expected to extract differentially the several classes of protein that might be present. The main facts regarding the solubilities of the simple uncoagulated proteins are as follows:

1. Albumins, some globulins, histons and protamins are soluble in water.

2. Globulins, together with most of the proteins soluble in water, dissolve in dilute (from 1 to 10 per cent.) sodium chlorid solution.

3. Prolamins are soluble in alcohol (from 70 to 90 per cent.).

4. Albuminoids are not soluble in dilute acid, dilute alkali, water, salt solutions or alcohol.

These are only qualitative statements of solubility behavior, and, although not exact in nature, probably afford the most satisfactory characterization of the different classes of protein.

With these statements in mind, the following solvents were chosen for the extraction of the substances giving the allergic skin reactions:

A. 1 per cent. sodium chlorid solution.
B. 5 per cent. sodium chlorid solution.
C. 10 per cent. sodium chlorid solution.
D. 0.5 per cent. sodium hydroxid solution.
E. 0.5 per cent. sodium hydroxid containing 5 per cent. sodium chlorid.
F. Coca's solution,[5] which is a dilute sodium bicarbonate, phenol (carbolic acid) solution.
G. 10 per cent. alcohol.
H. 70 per cent. alcohol.
I. 95 per cent. alcohol.

Solutions F and G, Coca's solution, and 10 per cent. alcohol solution serve as comparison solutions; Coca's solution being a satisfactory solvent for foodstuffs and animal emanations, and 12 to 14 per cent. alcohol being reported as a satisfactory solvent for animal allergens by Goodale,[4] Wodehouse [9] and others. The 95 per cent. alcohol solvent was used because it would not be expected to dissolve protein but should dissolve many protein split products, glucosids, nitrogen extractives and similar classes of compounds that might contribute to the allergic reaction.

TABLE 1.—*Character and Proportion of Material in Grams Treated with Twenty Cubic Centimeters of Solvent*

Material	Weight in Grams
Cabbage, fresh, ground	10
Banana, ripe, fresh, ground	10
Rye, milled flour	1
Horse dander, ether extracted	1
Chicken, bones removed, meat ground	5
Peas, dried, ground	1
Dog hair, ether extracted	..
Peanuts, ground, ether extracted	1
Salmon, fresh, bones removed, ground	5
Walnut, ground, ether extracted	1
Wheat, whole, milled flour	1

One or more of each of the following food groups was extracted: cereals, fruits, meats, nuts, seafoods and vegetables. Horse dander and dog hair were used for the epidermal structure extracts. The proportion of material to 20 c.c. of solvent in making the extracts is stated in Table 1. The extracts were made by continuous shaking with the solvent for one hour at room temperature, centrifugating out the major portion of undissolved material, and finally filtering through paper. The solutions were preserved under toluene in stoppered bottles, and kept in a refrigerator when not in use. Some precipitation occurred, on standing, in most of the extracts made, but all of these solutions appeared

4. Goodale, J. L.: Diagnosis and Management of Vasomotor Disturbances of the Upper Air Passages, Boston M. & S. J. **175** 181 (Aug.) 1916.

5. Coca, A. F.: Studies in Specific Hypersensitiveness, V, J. Immunol. **7**: 166 (March) 1922.

6. Wodehouse, R. P.: Preparation of Vegetable Food Proteins for Anaphylactic Tests, Boston M. & S. J. **175**: 195 (Aug.) 1916.

7. Osborne, T. B.: The Vegetable Proteins, New York, Longmans, Green & Co., 1923.

8. Wells, H. G., and Osborne, T. B.: Anaphylactogenic Activity of the Vegetable Proteins, J. Infect. Dis. **14**: 377, 1914.

9. Wodehouse, R. P.: VI, Immunochemistry of the Proteins of Cat Hair; VII, Horse Dander; VIII, Dog Hair, J. Immunol. **2**: 227, 237, 243 (April) 1917.

to have retained their activity over the period of about three months during which they were in use.

All the solutions were analyzed for their nitrogen contents by a colorimetric micro-Kjeldahl-Nessler method (Table 2). The designation nonprotein nitrogen has been arbitrarily applied to the nitrogen content present that is not precipitated in a 2 per cent. phosphotungstic acid solution (Table 3). This designation, though purely arbitrary, is as nearly the proper one as we can determine by a consideration of the literature on the precipitation behavior of protein and nonprotein nitrogenous compounds.

Consulting Table 2, we see that solutions D and E, viz., the 0.5 per cent. sodium hydroxid and the 0.5 per cent. sodium hydroxid plus 5 per cent. sodium chlorid, consistently gave the largest yield of total nitrogen per milligram per cubic centimeter. Comparing this with Table 3, which tabulates in the same manner for each substance and each extractive the difference between the total nitrogen and the nonprotein nitrogen per milligram per cubic centimeter, thus giving presumably the amount of protein nitrogen present, we find again that in almost every instance Solutions D and E were most efficient.

The skin tests reported were made by a single observer by the usual cutaneous scratch method on the arm or back of the person tested. A complete set of solutions of one material was tested at one time, in order to minimize the variations in reactions of the individual as much as possible. The markings indicating the reactions have the following significances: Zero denotes no reaction; + a questionable reaction; + + a distinctly positive but weak reaction; + + + a good positive reaction, and + + + + a strongly positive reaction, usually more than 1.5 cm. in diameter. In addition, it might be stated that no skin manifestation was called a reaction unless it showed definitely the pseudopods that we have learned to associate with the typical allergic skin reaction (Table 4).

Table 5 is a summary of the results obtained by using the solutions described above in the protein skin tests. In this table, the denominator of each fraction indicates the number of individual tests with each solution for each substance, and the numerator the number of positive skin reactions obtained. Thus, the total number of tests for each solution of each substance was thirty-four. It is seen on consulting this table that, from the clinical side, the most efficient extractives were Solutions A (1 per cent. sodium chlorid), B (5 per cent. sodium chlorid) and C (10 per cent. sodium chlorid), which gave the highest total number of positives, in spite of the fact that they do not contain either as much total nitrogen or protein nitrogen by difference as do

TABLE 2.—*Total Nitrogen in Milligrams per Cubic Centimeter*

Solvent	Cabbage	Banana	Rye	Pea	Horse Dander	Chicken	Dog Hair	Peanut	Salmon	Walnut	Wheat
A. 1% sodium chlorid	0.84	0.79	0.91	0.92	2.02	1.92	0.31	1.29	2.50	0.29	0.45
B. 5% sodium chlorid	0.78	0.78	0.85	1.14	2.01	2.61	0.15	3.00	2.55	0.43	0.43
C. 10% sodium chlorid	0.72	0.79	0.82	1.02	1.89	1.98	0.15	1.50	3.00	0.32	0.38
D. 0.5% sodium hydroxid	0.98	0.92	0.90	1.85	2.40	4.72	0.41	5.32	5.10	3.21	1.08
E. 0.5% sodium hydroxid + 5% sodium chlorid	0.96	0.88	0.90	1.43	2.19	3.79	0.38	4.30	3.50	2.35	1.00
F. Coca's solution	0.84	0.78	0.64	1.04	2.01	1.92	0.17	2.08	1.02	0.40	0.41
G. 10% alcohol	0.80	0.80	0.62	0.72	1.98	1.44	0.16	2.30	1.17	0.32	0.40
H. 70% alcohol	0.92	0.60	0.60	0.50	1.72	0.63	0.10	0.30	0.81	0.26	0.61
I. 95% alcohol	0.78	0.58	0.40	0.40	1.40	0.54	0.04	0.24	0.81	0.22	0.25

TABLE 3.—*Difference Between Total Nitrogen and Nonprotein Nitrogen in Milligrams per Cubic Centimeter*

Solvent	Cabbage	Banana	Rye	Pea	Horse Dander	Chicken	Dog Hair	Peanut	Salmon	Walnut	Wheat
A. 1% sodium chlorid	0.35	0.51	0.72	0.75	1.72	1.63	0.17	1.07	....	0.18	0.38
B. 5% sodium chlorid	0.29	0.58	0.66	0.97	1.69	2.32	0.01	2.74	....	0.32	0.36
C. 10% sodium chlorid	0.23	0.51	0.63	0.86	1.59	1.69	0.01	1.24	....	0.21	0.31
D. 0.5% sodium hydroxid	0.35	0.64	0.70	1.63	2.07	4.44	0.20	5.09	4.84	3.07	0.97
E. 0.5% sodium hydroxid + 5% sodium chlorid	0.29	0.62	0.69	1.21	1.89	3.52	0.20	4.06	3.22	2.22	0.91
F. Coca's solution	0.32	0.56	0.43	0.71	1.73	1.60	0.02	1.80	0.67	0.29	0.34
G. 10% alcohol	0.21	0.80	0.44	0.56	1.61	1.15	0.01	2.08	0.82	0.21	0.31
H. 70% alcohol	0.11	0.60	0.41	0.31	1.28	0.34	....	0.13	0.46	0.15	0.53
I. 95% alcohol	....	0.26	0.23	0.40	0.92	0.25	....	0.07	0.46	0.11	0.17

TABLE 4.—*Method of Tabulating Results of Skin Reactions with Horse Dander*

Solvent	Total Nitrogen, Mg. per C.c.	Nonprotein Nitrogen, Mg. per C.c.	Names of Subjects: M. J. M.	C. F.	Liv.	R. D.	W. D.	M. M.	P. R.
A. 1% sodium chlorid	2.02	....	+++	++++	+++	+++	++++	+	++++
B. 5% sodium chlorid	2.01	0.30	+++	++++	++++	+++	++++	++++	+++
C. 10% sodium chlorid	1.89	....	+++	++++	++++	++++	++++	++	++++
D. 0.5% sodium hydroxid	2.40	0.33	0	++	+++	++++	+++	++++	0
E. 0.5% sodium hydroxid + 5% sodium chlorid	2.19	0.30	0	+	+++	++++	+++	+	0
F. Coca's solution	2.01	0.28	+++	0	++++	++++	++++	+++	+++
G. 10% alcohol	1.98	0.37	+++	+++	++++	++++	++++	+++	++++
H. 70% alcohol	1.72	0.44	0	0	0	+++	+	++	0
I. 95% alcohol	1.40	0.48	0	++	0	++	+	0	0

TABLE 5.—*Summary of Skin Reactions Obtained by Using Various Extracting Fluids*

	A	B	C	D	E	F	G	H	I
Cabbage	2/4	4/4	3/4	0/4	2/4	1/4	0/4	2/4	1/4
Banana	2/2	2/2	2/2	2/2	2/2	2/2	1/2	1/2	1/2
Rye	2/3	3/3	3/3	1/3	0/3	2/3	2/3	0/3	0/3
Pea	1/1	1/1	1/1	1/1	0/1	0/1	0/1	0/1	0/1
Horse dander	7/7	7/7	7/7	5/7	5/7	6/7	7/7	3/7	3/7
Chicken	1/1	1/1	1/1	1/1	1/1	0/1	0/1	1/1	1/1
Dog hair	2/4	3/4	3/4	1/4	3/4	1/4	3/4	1/4	1/4
Peanut	3/3	3/3	2/3	2/3	2/3	3/3	3/3	1/3	1/3
Salmon	1/2	1/2	1/2	0/2	2/2	1/2	1/2	0/2	0/2
Wheat	3/3	3/3	3/3	0/3	3/3	2/3	2/3	2/3	2/3
Walnut	3/4	3/4	3/4	1/4	2/4	3/4	1/4	0/4	0/4
Totals	27/34	31/34	29/34	14/34	22/34	21/34	20/34	11/34	10/34

Solutions D and E. This, of course, is probably explained by the fact that the alkali content in Solutions D and E is sufficient to hydrolyze the proteins or other active substances present with consequent loss of activity. The least effective extractive proved to be the 95 per cent. alcohol, as would be expected. However, inspection of the table shows that although alcohol in this concentration is a very poor solvent for proteins, yet the considerable number of reactions obtained with many of the extracted materials indicates that some active substances, whether proteins or not, are extracted by this solvent.

SUMMARY AND CONCLUSIONS

1. Owing to our fragmentary knowledge of protein chemistry as applied to allergy, further research into the chemical nature of proteins and their clinical application in allergy is needed.

2. A systematic study of the actions of various chemical solvents in extracting substances capable of producing skin reactions indicates that the solvent known to be most effective in extracting the natural proteins without denaturization, namely, salt solution up to 10 per cent., is also most effective in obtaining skin reacting substances.

3. Neither the total nitrogen content nor the so-called protein nitrogen content by difference can be used to foretell the activity of a solution.

4. Ninety-five per cent. alcohol, although not a protein solvent, extracts substances that produce allergic skin reactions.

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ABSTRACT OF DISCUSSION

DR. J. H. BLACK, Dallas, Texas: The work of Dr. Piness emphasizes the fact that a very large amount of fundamental information is necessary before we can get better results than we are getting today in protein or pollen therapy. Using myself, because I happen to be a typical ragweed hay-fever sufferer, I have found that the nitrogen content of pollen extracts has no relationship to their activity in the nose or intracutaneously. I found that extracts could be digested with trypsin and dialyzed against distilled water and, though they would no longer give a biuret reaction, their activity was qualitatively and quantitatively unchanged. I shook extracts for four hours in a mechanical shaker, froze them solid for six days, boiled them for ten minutes, and put them in the autoclave at 10 pounds pressure for ten minutes without reducing or altering their activity. I found that extracts which, before digestion, were suitable for use as antigens in complement fixation tests, after digestion were antigenically inert, although as active as ever in the nose and skin. I found that animals injected with pollen extracts poor in protein did not show any evidence of anaphylaxis but, when bled afterward, and their serum mixed with some of the appropriate pollen extract, this mixture injected into the skin of a normal person gave a typical wheal. Pollen extracts which had been digested would, when mixed with these serums, give the same reactions in the skin of the normal individual. I believe, therefore, that there is a substance, other than protein, which is the active principle in pollen extracts. I believe that anaphylactic reactions in animals injected with pollen extracts are reactions to the protein of the extract and have no relationship to the active substance of the extract.

DR. GEORGE PINESS, Los Angeles: Our work did not include the chemical study of bacterial or pollen proteins, because we knew that this was being done by others. The interesting phase of this study was the fact that some workers stated that the reliability of the protein was dependent on the amount of nitrogen contained therein. I do not agree with them, because it was shown in our studies that many substances which contained very small amounts of protein nitrogen gave marked clinical reactions and vice versa.

HABITUAL HYPERTHERMIA DURING RECOVERY FROM SCARLET FEVER*

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By habitual hyperthermia we understand a chronic, moderate elevation of the body temperature for which no external cause, such as an infectious focus, can be found. The mean temperature lies above 37.5 C. (99.5 F.), and the peaks range between 37.8 C. (100 F.) and 38.2 C. (100.7 F.). Such cases are quite frequent in childhood.

The individuals affected are apparently of a sensitive type with vasomotor irritability, in whom careful examination reveals no findings to explain this condition. All organs, including especially the nasopharyngeal tract and cervical glands, are normal; and there is no latent tuberculosis. The elevated temperature persists for weeks and months without causing an appreciable disturbance of the general condition. The usual antipyretics have no influence on the hyperthermia. But, in many cases, by a sojourn in a favorable climate—in the mountains or at the seashore—the body temperature becomes normal in a short time and remains normal, either permanently or for a considerable period. The elevation of temperature is present even during bed rest, and thus "habitual hyperthermia" is differentiated from the so-called "exercise hyperthermia," which occurs in many children after slight muscular exertion.

How can this hyperthermia be explained? An infectious etiology cannot be determined; therefore, it seems permissible to assume that there is a disturbance of the normal temperature regulation. As is well known, the temperature is regulated by the center located in the midbrain. This center is connected by the autonomic nervous system—sympathicus and parasympathicus—with the heat producing organs (glands of metabolism, muscles) as well as with the physical heat regulators (sweat glands, capillaries of the skin). It is reasonable that a slight disturbance of this nervous apparatus, a neurosis of the autonomic system, may produce a chronic hyperthermia.

I have no experimental data on children of the type just described. I have, however, together with Dr. Block and Dr. Königsberger, investigated scarlet fever convalescents at the Kaiser and Kaiserin Friedrich-spital in Berlin. We were struck by the fact that a very large number of scarlet fever convalescents showed temperature elevations beginning in the third or fourth week after the scarlet fever itself had subsided and persisting for many weeks. I have been unable to find mention in the literature of this slight hyperthermia after scarlet fever, but undoubtedly it is observed everywhere with equal frequency.

What is the explanation? We found neither tuberculosis nor inflammatory sequelae, in spite of the most careful examination. The condition was present even after very mild scarlet fever that had been characterized only by fever and eruption. Thus, we considered a nervous disturbance of temperature regulation and attempted to solve the question by pharmacologic methods.

Hollo and Weil have worked along those lines in order to determine the genesis of similar temperature elevations in adults, which are usually erroneously

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explained on the basis of suspected tuberculosis. They found that subfebrility on an infectious basis is promptly influenced by good-sized doses of an antipyretic, whereas the noninfectious hyperthermia caused by essential disturbance of the nervous heat regulation is relieved by opium. The latter type of hyperthermia they have designated "constitutional subfebrility." Our patients reacted neither to opium nor to antipyretics, even when quite large doses were used. I do not wish to discuss here the extent to which the views of Hollo and Weil are correct. This question is of no importance for my purposes, since this investigation turned out negatively. I shall only mention briefly that even infectious fevers do not always subside as regularly to antipyretics as Hollo and Weil state.

PHARMACOLOGIC TESTS

But the idea of determining the cause of the fever by pharmacologic tests is fertile, and we carried it further by testing our patients with those remedies which are used for testing the autonomic nervous system, namely, atropin, pilocarpin and epinephrin. We used intravenous injections, since by oral, subcutaneous and perlingual administration the effect is either uncertain or absent. The dose of the drugs was that indicated by Friedberg as the smallest quantity just effective in normal children. We used from 2 to 5 decimilligrams ($^{3}/_{1,000}$ to $^{7}/_{1,000}$ grain) of atropin; from 4 to 7 decimilligrams ($^{6}/_{1,000}$ to $^{9}/_{1,000}$ grain) of epinephrin, and from 1 to 5 mg. ($^{2}/_{100}$ to $^{7}/_{100}$ grain) of pilocarpin, depending on the age of the child.

According to recent investigations, atropin produces fever quite frequently in normal children, presumably by inhibiting perspiration due to diminution of the vagus tonus. Epinephrin, also, is known to produce fever, which can probably be explained by heat stasis due to contraction of the capillaries of the skin. Pilocarpin either has no effect on the temperature or lowers it somewhat, probably because of increased sweat formation.

The reaction of the subfebrile scarlet fever convalescents was in marked contrast to this reaction of normal children. Atropin was persistently without effect. Pilocarpin always produced high fever, frequently 39 C. (102 F.), whereas the temperature in all cases became normal or even subnormal, following the administration of epinephrin. This effect of epinephrin usually persisted for from two to three days and in some cases the temperature remained permanently normal after a single injection of epinephrin. Control patients with slight infectious temperature elevation were never influenced.

Under these conditions, it seems permissible to attribute this habitual hyperthermia of scarlet fever convalescents to a balance disturbance in the autonomic nervous system or in the heat regulating center. There is, then, a neurosis. If we consider that epinephrin usually is regarded as a stimulant of the sympathicus, pilocarpin as a stimulant of the vagus, and atropin as an inhibitor of the vagus tonus, and if we see in our case that the sympathicus stimulation removes the fever, while vagus stimulation increases the fever, and vagus inhibition has no effect, we are led to think of a relative vagotonia due to weakness of the sympathetic nervous system.

How can we explain the frequency with which this hyperthermia is seen after scarlet fever? This cannot be accidental; rather, it must depend on the peculiarities of scarlet fever. Does scarlet fever perhaps go hand in hand with a change of the nervous system in the sense of a vagotonia?

In order to decide this question, we have tested pharmacologically the autonomic nervous system of fifteen children during and shortly after the acute stage of scarlet fever. Simultaneously, we tested a number of healthy children in the same way. We obtained the following results: Epinephrin, as a rule, produces a rise in blood pressure and acceleration of the pulse in the healthy child, whereas it produces lowering of the blood pressure and slowing of the pulse in patients with scarlet fever. The same behavior that was shown by our children with scarlet fever has been observed in animals after experimental vagus stimulation and also in adults with vagotonia. In both cases, by previous diminution of the vagotonus due to atropin, the reaction after the administration of epinephrin becomes normal.

This speaks for pathologic vagotonus as a regular consequence of scarlet fever. The fact that pilocarpin produces very marked secretion of saliva and sweat speaks for the same conclusions. Atropin produced no distinct effect. The eruption and the fever were, of course, not influenced by the drugs during the acute stage. Thus it may be said that scarlet fever apparently affects the autonomic nervous system in the sense of a vagotonia and that in many cases it leaves the patient for many weeks with a vegetative neurosis characterized by habitual hyperthermia.

CONCLUSION

Whether the cases of habitual hyperthermia that have no connection with scarlet fever can be explained in the same way is impossible for me to state. At any rate, it will be of interest to test them by the same methods.

The experience that, in a few cases, a single injection of epinephrin removed the hyperthermia allows us to hope that an effective method of treatment will be found. This is desirable, although hyperthermia is attended with no dangers and does not disturb the general condition of the patient. But the members of the family are usually very much alarmed, especially because they fear an occult tuberculosis.

Clinical Notes, Suggestions, and New Instruments

REPORT OF A CASE OF EARLY RUPTURE OF FETAL MEMBRANES

MILDRED VAN CLEVE, M.D., MACOMB, ILL.

"Dry labor," due to rupture of the membranes before complete dilatation of the cervix, at the onset of labor, or preceding labor by several hours or even days, is a not uncommon obstetric complication; but rupture weeks or months before delivery is rare. Williams[1] says of this condition: "Ordinarily, labor sets in within twenty-four hours after rupture of the membranes, but exceptionally, several days or even a week or longer may elapse. Meyer-Ruegg,[2] in 1904, collected from the literature fifteen cases in which several months elapsed between this occurrence and the completion of labor, though so long an interval is very unusual."

A search through the recent literature available affords but one reference to very early rupture of the membranes.

1. Williams: Obstetrics, New York, D. Appleton & Co., p. 245.
2. Meyer-Ruegg: Eihautberstung ohne Unterbrechung der Schwangerschaft, Ztschr. f. Geburtsh. u. Gynäk. 51:419, 1904.

McQuarrie,[3] in a report on 2,717 deliveries in the University of California Hospital, records two of the total 119 fetal deaths occurring in this series as having been due to this cause. In one of these cases, the child died from an ascending infection through the cord, the membranes having ruptured one month before delivery.

REPORT OF CASE

Mrs. E. R., aged 23, seven months pregnant, came to the clinic, June 6, 1924, complaining of a watery discharge from the vagina. The medical history was irrelevant; the first pregnancy had terminated in a normal, full-term delivery three years before; the second, in a spontaneous abortion in September, 1923, accompanied by rather profuse hemorrhage. She menstruated normally the last week in October, 1923, again became pregnant, felt quickening in February, and expected delivery about the first week in August, 1924.

The pregnancy proceeded normally until April 15, when the patient was awakened at night by a sudden gush of colorless fluid from the vagina, unaccompanied by pain, since which time a little fluid had dribbled from the vagina almost constantly, especially on exertion. Recently, this discharge had been at times blood-stained and malodorous, frequently containing white, cheesy particles. Late in May, the patient had two hemorrhages, the first lasting two days, followed in a week by another lasting one and a half days, the flow being somewhat more profuse than that of the menstrual periods. She had felt fairly well, had felt active fetal movements, and had had at no time any symptoms of labor.

Physical examination, made June 6, was negative except for rather marked pallor. Temperature, pulse, urine, blood pressure and pelvic measurements were normal. Abdominal enlargement was less than is usual at seven months; the fetus was small and easily mapped out; there was breech presentation; the movements were vigorous, and loud fetal heart tones were heard just below the umbilicus, at a rate of 140 a minute. There was a slight watery discharge from the vagina, without color or odor. Vulvar and vaginal tissues were moist and slightly edematous. On account of the suspicion of placenta praevia, a vaginal examination was made under aseptic conditions. The cervix was enlarged, edematous and boggy, and the external os was patulous; no placental tissue was felt, a foot presenting

A diagnosis was made of premature rupture of membranes, with a possible marginal placenta praevia, and the patient was advised to stay in bed for a time, elevating the hips and using antiseptic external douches and sterile perineal pads.

Four days later, however, she had not succeeded in making household arrangements permitting her to remain in bed all the time, and, about midnight, labor pains began, terminating the following morning at 9:45, June 10, in a breech extraction (footling) of a living male infant weighing 5 pounds, (2.3 kg.) slightly asphyxiated, but readily resuscitated. Very little liquor amnii escaped. Several large clots passed very shortly after the birth of the fetus. The placenta showed one partially detached cotyledon with adherent clots; the cord was eccentrically attached.

The puerperium was normal except for a temperature of 101 F. thirty hours post partum, dropping to 99 the following day, and continuing normal thereafter. The baby nursed well and gained satisfactorily under routine premature care.

SUMMARY

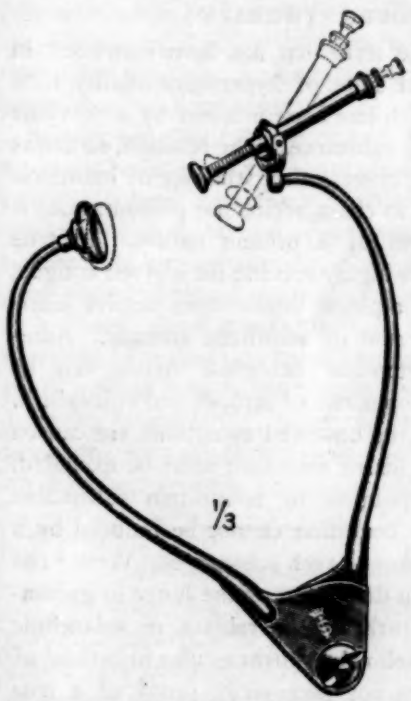
A case of unusually early rupture of the fetal membranes at about the twenty-fifth week of pregancy advanced to thirty-three weeks, and a living, healthy infant was delivered by breech extraction. There was no evidence of amniotic adhesions, and no infection of cord, umbilicus or endometrium. The pregnancy began within a few weeks after an abortion, and was also complicated by a slight premature separation of the placenta.

3. McQuarrie, J. G.: Fetal Death, a Study of One Hundred and Nineteen Deaths in a Series of Cases, J. A. M. A. 73: 1574 (Nov. 22) 1919.

AN INSTRUMENT TO DETERMINE THE DIFFERENCE IN EXPANSION OF THE TWO SIDES OF THE UPPER CHEST IN PULMONARY TUBERCULOSIS

I. R. WAGNER, M.D., NEW HAVEN, CONN.
Surgeon (R.), U. S. Public Health Service

This instrument, which I have called "thora-meter," is built after the plan of the original caliper, with special features attached to the free ends. The arms of the caliper are curved slightly, with ends curved to point at right angles with the length of the arm. One arm is longer than the other, and has attached a pad of the ball and socket type, permitting free movement and conformity to the surface of the body. The other and shorter arm of the caliper has attached a measuring device, composed of a barrel with a movable rod passing through, controlled by a coil spring. This plunger rod passing through the barrel is calibrated for measuring expansion, and is held snugly against the surface by the coil spring, which permits free movement of the plunger during respiration. The caliper joint is made of wide wings with a thumb nut to hold the calipers rigid, and still allow movement by forcing the arms wide apart or bringing them closer together to fit the thorax to be measured. The wide joint wings are intended as a brake to assist in holding the arms of the caliper at the distance apart desired. These wide joint wings may be calibrated for measuring the anteroposterior diameter of the chest.



Instrument to determine difference in expansion of the two sides of the upper chest.

The instrument is simple, and with a very little study of the information desired and the points of the instrument, proficiency in operation will be easily attained. I have selected as points of operation the fourth or fifth dorsal spine and second rib, about 2 inches from the margin of the sternum. The instrument is placed over the shoulder with the large circular pad pressed tightly against the fourth or fifth dorsal spine, and with the plunger pad fitted snugly on the second rib, about 2 inches from the sternal margin. The patient is instructed to breathe, the operator watching the calibrated plunger; the measurements are carefully noted.

Then the instrument is changed to the opposite side, being placed over the corresponding points, and a careful reading of calibrations is made. The anteroposterior expansion as measured with the thora-meter multiplied by 3.1416 will not equal the circumferential expansion as measured by tape line, owing to the fact that thora-meter measurements are bone measurements, and the expansion is actual bone expansion, while tape line measurements take in muscle expansion as well as expansion of the bony thorax. In order to obtain the best service of this instrument, it is necessary to instruct the patient how to breathe. All men, and some women, after discarding corsets, use abdominal breathing. This can be overcome, and the patient taught to breathe with the entire thorax, with very few instructions.

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SATURDAY, AUGUST 23, 1924

ANAPHYLACTOID PHENOMENA AND MODERN THERAPY

Anaphylaxis is the term that has been restricted, in recent years, to that state of hypersusceptibility to a given substance which has been induced by a previous injection of the same substance. The reaction, so far as it meets the various criteria that students of immunology have employed to characterize the phenomenon, is limited to substances of a protein nature. In true anaphylaxis, which is highly specific for a given antigen, it is possible, for example, to demonstrate passive sensitiveness with the serum of sensitized animals. Amelioration of the attendant bronchial spasm can be brought about by proper use of atropin and epinephrin. The possibility that the observed symptoms are caused by capillary thrombosis or embolism must be excluded. Natural hypersusceptibility to nonprotein substances may occur, but this condition cannot be induced by a previous administration of such substances. Wells [1] has pointed out that even distention of the lungs in guinea-pigs, circulatory disturbances in rabbits, or splanchnic congestion in dogs, following intravascular injections of foreign materials, is not necessarily proof of a true anaphylactic reaction; each and all may be produced by materials or under conditions that surely do not involve the same processes that are responsible for the reaction which occurs when a small quantity of an otherwise harmless protein is injected into an animal that has been previously prepared at a sufficiently great interval of time, by injection of the same protein.

Several years ago, Karsner and Hanzlik [2] demonstrated that a considerable variety of chemically unrelated substances may produce what they termed "anaphylactoid" symptoms after intravenous injection, by virtue of their causing occlusion of the pulmonary capillaries by thrombosis or by agglutinated corpuscles or platelets. With such capillary obstruction there may occur a marked bronchial constriction, which causes asphyxia and permanent distention of the lungs. This bronchial constriction, which has commonly been interpreted as proof of a true anaphylactic shock, differs from that of true anaphylaxis in not depending on a contraction of the bronchial musculature, which, they contend, is shown by the failure of epinephrin and atropin to influence the respiratory effects in the same way that they control anaphylactic bronchial spasm. A renewed investigation of the subject by Hanzlik and Karsner [3] has confirmed their earlier experience and extended it to include numerous substances of current interest to physicians, because some of the materials have been more or less widely recommended for use in intravenous therapy. These chemically and physically unrelated products may produce similar symptomatic and histologic changes, and likewise well defined alterations of the blood. Capillary permeability may become enhanced, as witnessed by peribronchial and perivascular edemas; agglutination of blood formed-elements may bring about thrombosis; altered equilibrium of chemical components of the blood may induce symptoms of acidosis.

Into the heterogeneous category of materials that may incite such reactions fall a variety of "colloidal" solutions of iron, mercury, arsenic, antimony and protein, as well as extracts of animal tissues. In animal experiments, the intravenous effects apparently cannot be predicted from their physical and chemical properties or—and this is significant also—from their physiologic effects when given by mouth. Many of the agents studied by Hanzlik and Karsner are advocated to be used intravenously in place of oral and safer methods of administration. A protest [4] against the threatening abuse of intravenous therapy has already appeared in THE JOURNAL. It may nevertheless be advisable to reiterate here that there seems to be little, if any, justification for the intravenous administration of such agents as hexamethylenamin, sodium iodid and sodium salicylate, because their ordinary systemic effects are readily and promptly obtained from oral administration. On the contrary, as Hanzlik has often pointed out, other and more detrimental effects may be obtained from intravenous medication. Thus, such an agent as acacia, injected intravenously, may be temporarily beneficial to one function but detrimental to others and to the organism as a whole. According to the most recent findings,[3] even intraperitoneal injections of some of the substances that should not be used freely directly by vein are not without menace. Pharmacology and experimental therapeutics have established the value of numerous agents for which intravenous injection is relatively safe, and other methods of use may be unsuitable. The indiscriminate

1. Wells, H. G.: The Present Status of the Problems of Anaphylaxis, Physiol. Rev. **1**: 44 (Jan.) 1921.
2. Karsner, H. T., and Hanzlik, P. J.: J. Pharmacol. & Exper. Therap. **14**: 229, 379, 425, 449, 463, 479, 1919.
3. Hanzlik, P. J., and Karsner, H. T.: Further Observations on Anaphylactoid Phenomena from Various Agents Injected Intravenously, J. Pharmacol. & Exper. Therap. **23**: 173 (April) 1924; Treatment of Anaphylactoid Phenomena from Some Agents by Hypertonic Sugar and Salt Solutions, ibid., p. 237; Effects from the Intraperitoneal Injection of Various Agents Causing Anaphylactoid Phenomena, ibid., p. 243.
4. Intravenous Therapy, J. A. M. A. **80**: 1331 (May 5) 1923.

employment of drugs, particularly unfamiliar ones, is "irrational, unscientific and dangerous." The dangers of anaphylaxis have become more and more apparent to clinical observers, and the manifold possible effects of allergic phenomena in the organism are beginning to attract widespread interest. Has not the time arrived for more serious consideration of the somewhat comparable though perhaps unrelated so-called "anaphylactoid" manifestations for which the physician himself may become responsible through carelessness in his therapeutic procedures?

ALKALOSIS AS A CLINICAL CONDITION

Numerous investigations of recent years have furnished indications that the normal processes taking place within and about the living cells of the body are carried out in fluids that are maintained constant in respect to reaction within rather narrow limits, as measured by hydrogen ion concentration. For the blood this is slightly alkaline, being represented by a reaction equivalent to p_H 7.4. This constancy is made possible by the admirable series of regulatory devices of varied character that are at the disposal of the organism. Respiratory adjustments, kidney elimination and buffer substances are conspicuous among these. Acids are continuously formed in greater or lesser degree in the metabolism, so that they in particular are concerned in these regulatory functions. As Wilson [1] has pointed out, the tissues and blood must be protected against any great change in reaction during the period between formation and elimination of acid. The buffers in the tissues and blood constitute the great source of protection in this connection. The proteins and phosphates are probably the main buffers concerned.

In the discussions of acid-base balance, much consideration has naturally been given to those features that might be expressed as acidosis. Under conditions of abnormal acid production in disease as well as under certain physiologic conditions, such as severe muscular exercise, also resulting in increased elaboration of acid, it has been said that the organism may at times be embarrassed seriously in respect to the ability of the adjustment mechanism to maintain optimal conditions of reaction. The reverse condition of alkalosis, though recognized as an experimental possibility, has never been given the serious consideration accorded to acidosis as a possible clinical entity. It is important, therefore, to learn from investigations lately recorded [2] that alkalosis is a condition much more common than has ordinarily been supposed, and has often been overlooked by the clinician. When both the bicarbonate and the hydrogen ion concentration of the blood are ascertained, a reliable index of the acid-base balance is secured.

It has been pointed out that conditions of alkalosis have been neglected in the past for the reason that the clinical symptoms are not readily recognized or easily defined. Symptoms that may be noted, however, are headache, lassitude, nausea, vomiting, fever and, in some cases, tetany. Kast, Myers and Schmitz have furnished illustrations from the service of the New York Post-Graduate Medical School and Hospital of unquestionable cases of alkalosis that would be overlooked ordinarily unless laboratory methods of diagnosis were applied. Some of the instances involved patients receiving sodium bicarbonate for therapeutic purposes, usually in the treatment of gastric ulcer. These investigators remark that, in the past, sufficient caution has not always been employed in the therapeutic use of this chemical compound. With impaired ability to excrete alkali, relatively small amounts of sodium bicarbonate will lead to alkalosis. Not infrequently, we are further told, alkalosis appears to have been mistaken for acidosis, leading to alkali therapy, which aggravated the condition.

Alkalis have long had a vogue in the treatment of severe diabetes, particularly the acidosis and coma sometimes associated with them. Of late there has been a reaction against the too liberal use of sodium bicarbonate.[3] In this connection, Kast, Myers and Schmitz have observed that ketonuria is not an infallible sign of acidosis, since it may exist in the presence of an alkalosis. On the other hand, instances of fatal diabetic coma without ketosis have lately been recorded in THE JOURNAL.[4] Evidently, some of the traditional beliefs associated with the problems of alkali balance and alkali therapy need revision.

ALCOHOL AND THE HEART

The protagonists for the use of alcohol freely admit that this substance is a narcotic when used in large doses. The controversy regarding its physiologic effects centers on the action of more moderate intakes, such as do not betray themselves by an inebriating outcome. In relation to these, we are told that alcohol is a sedative on some human functions and a stimulant to others. Thus, one writer [5] freely asserts that in moderate amounts alcohol "is distinctly a heart stimulant and a cerebral vasodilator." He further recalls experiments indicating that alcohol produces a relative acceleration of the pulse; indeed, it is alleged that alcohol, in heroic doses, can stimulate in certain cases "to the point of dragging the moribund from the very portals of death." With respect to the pulse, the majority of observers are agreed in stating that the swallowing of a moderate dose of alcohol is followed by an increase in the rapidity of the heart beat, which lasts for about half an hour.

1. Wilson, D. W.: Neutrality Regulations in the Body, Physiol. Rev. 3: 295 (July) 1923.
2. Kast, Ludwig; Myers, V. C., and Schmitz, H. W.: Clinical Conditions of Alkalosis, J. A. M. A. 82: 1858 (June 7) 1924.
3. The situation is summarized by Joslin, E. P.: Treatment of Diabetes Mellitus, Philadelphia, Lea and Febiger, 1923, p. 560.
4. Paddock, B. W.: A Fatal Case of Diabetic Coma Without Ketosis, J. A. M. A. 82: 1855 (June 7) 1924.
5. Flint, G. E.: The Whole Truth About Alcohol, New York, the Macmillan Company, 1919.

There are some who have failed to detect this action, and others even who observed that the pulse became slower after alcohol was taken. The rate of the pulse is not a matter concerning which there can be a difference of opinion, and it can only be concluded that different subjects react differently to alcohol in this respect, while dose and dilution have probably some influence on the effect. There seems to be no doubt that a slight quickening of the pulse commonly occurs.

The report [6] of the Advisory Committee of the Central Control Board (Liquor Traffic) of London, representing the carefully formulated opinion of scientific experts, charges that there is very good reason for believing that this effect, weak and inconstant as it is, is not due to a direct action of alcohol on the heart. It has been seen to occur when alcohol of sufficient concentration (50 per cent.) was simply taken into the mouth and rejected without being swallowed. In this case, the quickening of the pulse lasted only a few minutes, whereas, if the dose was swallowed, the quickening lasted for approximately half an hour. It seems reasonable to attribute at least a part of the result to the continuance in the stomach of the irritating action of alcohol on mucous membranes, which must be the immediate cause of the effect seen when alcohol is held in the mouth. Although all are agreed that in greater concentrations alcohol is directly harmful to the heart, the deductions regarding the possible stimulant action have been decidedly divergent. To give a direct answer with respect to the cardiac musculature itself, it becomes necessary to make the test on the heart separated from the central nervous system. The organ should be performing a normal amount of work under experimental conditions in which all the factors that may influence this—the arterial resistance, the inflow of blood, the temperature—are kept constant, apart from any influence of the drug itself. When these conditions are fulfilled, as in the recent studies of Sulzer [7] at University College, London, there is no evidence of any stimulant effect of alcohol on the heart in any doses. With concentrations of alcohol in the blood as low as 0.06 per cent., the only effect observed is an increase in diastolic and systolic volumes of the ventricles; this becomes more marked as the concentration of alcohol in the blood is increased. The action of alcohol on the heart muscle, as soon as any effect whatever is produced, is thus purely depressant. With higher amounts of alcohol, such as 0.3 or 0.4 per cent., there is a diminution in the output of the heart, and a considerable rise in venous as well as pulmonary pressure. In concentrations of from 0.1 to 0.2 per cent. onward, alcohol causes the coronary vessels to constrict and to reduce the coronary flow. These investigations confirm what Newell Martin [8] observed at Johns Hopkins University more than forty years ago. As the British report properly concludes, no scientific ground has been discovered for any claim made on behalf of alcohol to practical value as a direct stimulant of the heart in cases of threatened failure of the beat. When it appears to promote recovery from fainting, it probably acts simply by virtue of its irritant action on the mucous membrane of the mouth and throat. The fact that the beneficial effect appears almost immediately, and long before any significant amount of alcohol can have been absorbed and carried to the heart, is evidence for this local and indirect nature of the action. Its use in these circumstances is, therefore, comparable with that of smelling salts, or the irritating fumes of burnt feathers traditionally employed for the same purpose. If, in conditions of more protracted weakness of the heart, the administration of alcohol has a beneficial effect, this must be attributed mainly to its mildly narcotic and sedative action, relieving the centers, which modify the action of the heart, from the disturbing influence of pain and anxiety. The promotion of a patient's comfort, the relief of mental strain, may be an essential element in the treatment of disease, and an important factor in recovery. It does not, however, justify the description of alcohol as a "stimulant" of the heart. In this direction, as in others, the popular idea that it is a "stimulant" proves on examination to be scientifically untenable.

6. Alcohol: Its Action on the Human Organism, London, H. M. Stationery Office, 1918.
7. Sulzer, R.: The Influence of Alcohol on the Isolated Mammalian Heart, Heart 11: 141 (April) 1924.
8. Martin and Stevens: Studies from the Biological Laboratory of the Johns Hopkins University 2: 477, 1883.

THE HEALTH OF CHILDREN IN INSTITUTIONS

During childhood there is comparatively great susceptibility to certain types of diseases and to influences that may exert some retarding influence on growth and development. Some of these dangers are augmented by congestion of population and by systems of living that increase the possibility of contact infections. Probably these are some of the things responsible for the widespread impression that the institutional care of children is detrimental, or at least unfavorable, to health and proper nutrition. The difficulties seem to be accentuated further by the fact that the young who are consigned to the care of a sheltering institution are likely to come from homes or surroundings that are far from advantageous; indeed, such neglected young are frequently found to be physically deficient, if not actually the victims of incipient disease. In considering the fate of children consigned to institutions where group living prevails, rather than to so-called foster homes where the individual dominates, we may overlook the great progress that has been made in recent years in the management of institutional inmates. The methods of housing and sanitation have been improved in many parts of the world; the problems of nutrition and personal hygiene have been approached with due recognition of recent contributions to the sciences they represent. Hence a student of child

welfare[1] has remarked that, in an institution where children are under full control day and night, it should be possible to eliminate malnutrition entirely, and the presence of a malnourished child among those who have been in the institution a sufficient time for study and treatment requires explanation. He asserts also that all correctional institutions for children, such as truant and parental schools, should be so organized as to seize the first moment a child comes under their control to look into his physical condition. Much of the disciplinary difficulty with these children, we are further told, is due to bad physical condition, and surprising results in the way of improved behavior frequently follow improved nutrition and the removal of defects.

That such aspirations are not futile has been clearly indicated in two independent reports published during the past year. Holt and Fales,[2] who studied the children in a home and school for poor children in New York within the heart of the uptown business section in a building "dark and rather gloomy" but subject to good sanitary and medical supervision, noted remarkably satisfactory conditions. They remark that the impression is prevalent that children living in institutions decline in general health and vitality, and that their growth and physical development are inhibited. Holt and Fales' observations of these children show that this is not a necessary result, and that the contrary may be true. The carefully controlled life in a properly managed institution, the regular hours, the good food and the lessened chances of infection, because the children do not come in contact with other children as do those who attend public school, make it possible to keep these children in excellent health; in fact, in much better condition than children in most private homes.

Equally encouraging is the tribute to institutional possibilities paid by Katz and Gray[3] in a review of conditions in a recently investigated large home for children in Boston. Despite the strict regimen, children of the poorest class, when under proper institutional care, are shown to catch up rapidly to normal children in physical respects. The longer they stayed in the institution, the larger was the percentage of children who were above the average in nutrition and development. This is not the story of an exclusive private home; it relates to an institution in which malnutrition is not a cause for exclusion, but rather for admission. The time has probably arrived for counteracting the impression that children living in an institution tend to decline in vitality, and that their development may be inhibited. There are evidently many places where health is splendidly safeguarded even in the absence of much that constitutes "home" to the child.

1. Emerson, W. R. P.: Nutrition and Growth in Children, New York, 1922.
2. Holt, L. E., and Fales, H. L.: Observations on the Health and Growth of Children in an Institution, Am. J. Dis. Child. **26**: 1 (July) 1923.
3. Katz, S. E., and Gray, Horace: Health and Growth of Children in an Institution, Am. J. Dis. Child. **27**: 464 (May) 1924.

Current Comment

BRINCKMANN'S AMERICAN RHINE RUHR RELIEF

The medical profession is being circularized by one Rev. Helmuth M. Brinckmann, who describes himself as "Director" of the "American Rhine Ruhr Relief," with headquarters at 405 West One Hundred and Twenty-Fifth Street, New York. Mr. Brinckmann states that he is appealing to "several thousand physicians," each of whom he urges to send in "at least $1.00." Just why Rev. Brinckmann circularizes physicians rather than preachers is not clear. A well known physician who has taken more than ordinary interest in the relief of suffering overseas asked Mr. Brinckmann for details regarding the collecting and transmitting of the "relief fund." Mr. Brinckmann replied that his credentials "were submitted to, and approved by church, state and municipal authorities" but, he added:

> "No one is actively associated with me in soliciting the funds. I myself superintend my mail campaigns, preach in churches and call upon individuals who have indicated their sympathy with my work."

On Mr. Brinckmann's own admissions, it behooves the medical profession to think twice before sending him contributions. The public, when called on to subscribe to laudable enterprises, has the right to expect that the money sent in will be handled by a disinterested and responsible committee that will prepare and publish an account of receipts and expenditures, audited by qualified accountants.

MUSCULAR WEAKNESS AS A SYMPTOM OF DIETARY DEFICIENCY

It is not likely that the pathologic conditions that have already become familiar to students of deficiency diseases are the only abnormalities of structure or function for which a lack of some essential dietary component can be held responsible. For the most part, the study of the problems of defective diet is too recent in its development to have encompassed the range of possibilities. Scurvy and rickets, beriberi and xerophthalmia are surely only a few of the disease entities that can be charged to faulty regimen. Nor is it likely that avitaminosis of one type or another represents the only condition that leads to deviation from normal nutrition and development. Mellanby[1] and his co-workers have noted that the structure and function of the voluntary muscles can also be greatly influenced by the dietary peculiarities that lead to unsatisfactory calcification of the bones. The supply of inorganic salts, of phosphorus and calcium, as well as of the fat-soluble vitamins, is here concerned. Mellanby asserts, for example, that it is easy in the case of growing puppies to produce all degrees of activity and lethargy, from extreme restlessness and great running speed down to absolute paralysis, by small changes in the diet. On the whole, the muscle changes, which are said to be detectable microscopically and by

1. Mellanby, E.: Discussion on Nutritional Diseases in Animals, Proc. Roy. Soc. Med. (Sec. Comparative Med.) **17**: 19 (April) 1924.

chemical analysis as well as by the effect on the gross contractile power, run *pari passu* with the osseous changes, so that defective bone calcification goes with weak muscles, and perfect bone formation with muscles of great strength and contractile power. Of course, as Mellanby suggests, such a relationship might be expected for teleologic reasons; for it insures that powerful muscles shall have correspondingly strong bony support. It may be recalled that McCarrison has emphasized the possible importance of changes in the musculature of the gastro-intestinal tract in connection with the use of faulty food. Thus, the horizon of the deficiency diseases is expanding.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Another Kind of Quack.—W. B. Mason, Anniston, a negro, was arrested, August 9, for practicing medicine without a license, it is reported. Mason admitted that he had performed "many medicinal deeds," when his instruments were presented in court, but claimed he had neither received nor asked any fees. His greatest trouble in life, he said, is generosity, but when asked to cite a specific case his memory failed.

CALIFORNIA

Chiropractor Treats Smallpox.—E. W. Davidson, Wilmar, a chiropractor, was recently fined $100 for failing to report contagious disease, it is reported. It was brought out at the trial that Davidson treated two cases of smallpox.

Osteopathic License Revoked.—The osteopathic license issued to Arthur E. Pike, Long Beach, has been revoked for the alleged use of "M.D." after his name. The report states that Pike acknowledged he had "bought his M.D. degree from a St. Louis medical college for $100.00." This action, according to the report, was taken by the California Board of Osteopathic Examiners.

COLORADO

Hospital News.—The board of directors of the National Jewish Hospital for the Treatment of Tuberculosis, Denver, has announced plans for the addition of an infirmary building to that institution.

ILLINOIS

Personal.—Dr. William H. Baker, Quincy, has been elected president of the city board of health.——Dr. William S. Keister, director of the joint health activities of Charlottesville, Va., Albemarle County and the University of Virginia, has been appointed director of the health department of Decatur.

Chicago

Personal.—Dr. H. Gideon Wells, professor of pathology at the University of Chicago, addressed the Northern Minnesota Medical Association, Duluth, August 5, on "The Relation of Heredity to Cancer."

Medical Arts Club.—It is reported that a fifteen-story clubhouse for physicians and dentists, to be known as the Medical Arts Club, will be erected on Lake Shore Drive at Ontario Street. The first ten stories will be built next spring, comprising an auditorium, banquet hall, grill room, library, ballroom and 100 sleeping rooms. The building will be the home of the Chicago Medical Society and the Chicago Dental Society.

INDIANA

Hospital News.—The new infirmary at Tipton, which was to have been built this year and for which $75,000 in bonds have been sold, has been delayed until January, 1925.——Dr. Horace G. Read has been elected president of the Tipton County Hospital organization.

Faculty Changes at the University School of Medicine.—The trustees of Indiana University have announced the following changes in the faculty of the School of Medicine, Indianapolis:

Dr. William F. Hughes, now associate professor of ophthalmology, to clinical professor of ophthalmology; Dr. Sidney J. Hatfield, associate professor of gynecology, to clinical professor of gynecology; Dr. Bernard J. Larkin, assistant professor of gynecology, to clinical professor of gynecology; Dr. George S. Row, associate in ophthalmology, to assistant professor in ophthalmology; Dr. Gustavus B. Jackson, associate in obstetrics; Dr. Leonard A. Ensminger, associate in surgery; Dr. Cleon E. Nafe, associate in surgery.

The following assistants have been made associates: Drs. Carl Habich, gynecology; Wendell D. Little, surgery; Robert M. Moore, medicine; Ross C. Ottinger, gynecology; James O. Ritchy, medicine; Cecil I. Rudicell, medicine; Frank C. Walker, gynecology; James A. Wynn, medicine. The following have been appointed assistants: Drs. Daniel S. Adams, rhinology, otology and laryngology; Louis D. Belden, surgery; George W. Bowman, dermatology; Arthur E. Guedel, surgery; Russell R. Hippinsteel, pediatrics; Foster Hudson, obstetrics; Karl M. Koons, surgery; Roy V. Myers, gynecology; Richard Wynn S. Owen, surgery; Dudley A. Pfaff, surgery, and D. L. Smith, obstetrics.

State Medical Society Meeting.—The annual meeting of the Indiana State Medical Association will be held in Indianapolis, September 24-26. With the approval of the council, the scientific committee has decided on the innovation, as far as this state is concerned, of having outside physicians furnish the program. The forenoons will be devoted to dry clinics, and the afternoons to addresses. Wednesday and Thursday, one hour will be given to surgical clinics, another to medical clinics, and the third to eye, ear, nose and throat clinics. The same division will hold in the afternoons for addresses. Friday afternoon will be given over to the sections. A large number of prominent physicians throughout the country are on the program. There will be the usual smoker and social evening, Wednesday, with Indianapolis physicians as hosts. At the public meeting, Thursday evening, the principal speakers will be a layman and a surgeon of national reputation. Physicians in good standing from outside the state, particularly those in adjoining states, are cordially invited to these meetings.

IOWA

Hospital News.—The contract has been awarded for the erection of a $115,000 building at the Burlington Hospital, Burlington.

Physical Examinations at State Fair.—The state board of health and the Iowa Federation of Women's Clubs are cooperating to arrange for free health examinations at the Iowa state fair. A room has been completely equipped for this purpose in the women's and children's building.

KANSAS

Hospital News.—Dr. Charles C. Keester, Wichita, will build a hospital at 1600 East Harry Street, to cost about $15,000.

Dr. Uhls Sentenced.—Dr. Kenneth B. Uhls, Kansas City, formerly head of a narcotic sanatorium at Overland Park, has been sentenced by Judge Farchild, it is reported, to twenty-five years in the Kansas prison at Lansing following his conviction on a charge of second degree murder in connection with the death of W. E. Gibbs (THE JOURNAL, June 28, p. 2124).

Acting Dean to Be Appointed.—The state board of administration has authorized the appointment of an acting dean for the University of Kansas School of Medicine, Rosedale, and the appointment will be announced within a few days. It is reported that the chancellor has been authorized to proceed to a nomination to the board of a permanent dean as soon as possible but that no nomination is likely to be made until the beginning of the academic year. At an official meeting of the board and chancellor, August 7, a statement was authorized in part as follows:

The resignation of Dr. Mervin T. Sudler as dean has been in the hands of the chancellor and the Board of Administration for some time, but it was not officially accepted until Aug. 7, 1924, the first meeting of the board and the chancellor since July 21. The chancellor and board hold Dr. Sudler in high regard, both personally and professionally, and appreciate his services to the medical school.

KENTUCKY

Personal.—Dr. Derby H. Swengel, Paintsville, county health officer, has tendered his resignation, effective September 1. Dr. Swengel expects to return to his former home, Lewisburg, Pa., to engage in general practice.

Fined for Failing to Report.—Nine physicians of Louisville, seven of them negroes, were arrested on warrants sworn to by the registrar of the bureau of vital statistics, and fined for failing to file birth certificates within ten days.

MAINE

Clinic for Crippled Children.—It is reported that practically every physician in Augusta attended a clinic for crippled children at the Augusta General Hospital, August 2, and that fifty-nine cases were examined. The Augusta Public Health Association, the Maine Public Health Association, the Rotary Club, the Parent-Teachers' Association, mothers' clubs and others cooperated in making the clinic a success. The clinic, which was entirely diagnostic, was conducted by specialists from other cities of the state, and was one of several which have been arranged by the Maine Public Health Association. A similar clinic will be held in Skowhegan, and another in Bangor, early in September.

MASSACHUSETTS

Hospital Bequeathed to Weymouth.—The town of Weymouth has been bequeathed $300,000 by the will of the late Laban Pratt, Dorchester, for the purpose of establishing a hospital at Weymouth Heights, the birthplace of the donor.

Investigation of Medical Service in Rural Regions.—The legislature has directed the department of health to investigate the conditions existing throughout the state with respect to the maintenance of adequate health and medical service in sparsely settled districts. Dr. George H. Bigelow, Boston, chairman of the committee to make this investigation, has requested such advice and assistance as the public may be able to give. Facts or suggestions should be sent to the state department of health, State House, Boston.

Community Health Association Reduces Budget.—A lack of funds has necessitated a retrenchment by the Community Health Association, Boston, which entails the discharge, September 1, of fifty nurses and a part of the executive staff, it is reported. The financial support of this association, formed by the amalgamation of the Baby Hygiene Association and the Instructive District Nurses' Association, has not kept pace with the growth of its work, which, last year, increased from 13,678 persons cared for to 16,436. The retrenchment means, it is said, that 480 fewer persons will be cared for by nurses each day. The mayor of Boston has agreed that the city will take over the baby hygiene work in Charleston, East Boston, and the north, south and west ends. In the fourteen years during which such work has been done among babies, the infant mortality in Boston has dropped from 120.1 per thousand to 82.49.

MICHIGAN

Typhoid at Midland.—Eight cases of typhoid fever developed in Midland in one week, recently, it is reported.

Personal.—Dr. Joseph H. Sherk, Midland, has been elected president of the city school board.——The director, U. S. Veterans' Bureau, has designated Dr. Frank E. Leslie to be in charge of the new Veterans' Bureau hospital for neuropsychiatric patients at Camp Custer, near Battle Creek. Dr. Leslie has been in charge of Veterans' Bureau Hospital No. 24 at Palo Alto, Calif., and will be succeeded there by Dr. Parker G. Borden.

University News.—The following changes at the University of Michigan Medical School, Ann Arbor, have occurred recently: Dr. Louis E. Stern, instructor in the department of internal medicine, has resigned to enter general practice in California; Dr. Nicholas M. Alter, instructor in the department of internal medicine, has been appointed professor of pathology at the University of Colorado; Dr. William A. Smith, intern in neurology, has been appointed instructor. In the department of surgery, Dr. Carl E. Badgley has been appointed assistant professor vice Dr. Le Roy C. Abbott, resigned; Dr. Howard B. Baker, instructor vice Dr. Frank E. Curtis, resigned, and J. Basil Hume, senior demonstrator of anatomy, St. Bartholomew's Hospital, London, has been appointed instructor for one year.

MINNESOTA

Minneapolis Delays Decision on Iodin.—A decision on the question of treating the public water supply of Minneapolis with iodin for the prevention of simple goiter, which has been under consideration for some time, has been postponed thirty days in order that the council committee may further study the problem and citizens be given a further opportunity to present their views at hearings.

University Appointments.—At a meeting of the administrative board of the University of Minnesota Medical School, Minneapolis, the following nominations were approved: Dr. Frank W. Stevenson, Minneapolis, as assistant in medicine; Dr. Gordon R. Kamman, St. Paul, as assistant in nervous and mental diseases; Dr. Hendrie W. Grant, St. Paul, as assistant in ophthalmology and otolaryngology; Dr. Axel S. Noran, Minneapolis, as assistant in pediatrics. The resignation of Dr. Arthur L. Kusske, Minneapolis, as refractionist was accepted, and Dr. Harold L. Goss, Rochester, was nominated to fill the vacancy.

Society News.—Dr. L. G. Guyer, Nopeming, state inspector of sanatoriums, was elected president, and Dr. Jacob Harry Bendes, Oak Terrace, vice president, of the Minnesota Sanatorium Association at the annual meeting, Thief River Falls, July 17. Dr. Guyer addressed the association on "Heliotherapy and the Alpine Lamp Treatment in Pulmonary Tuberculosis."——At the annual meeting of the Northern Minnesota Medical Association, Duluth, August 5, Dr. Edward L. Tuohy, Duluth, was elected president; Dr. John A. Thabes, Brainerd, vice president, and Dr. William W. Hill, Bertha, secretary-treasurer (reelected). Brainerd was chosen as the next meeting place.

MONTANA

Personal.—Dr. Charles Nelson Leach, who has been conducting investigations for the Rockefeller Institute for Medical Research in the Far East for the last three years, is visiting Governor Dixon, his father-in-law, at Helena.

State Medical Meeting.—At the annual meeting of the Medical Association of Montana, Helena, July 9-10, Dr. George McGrath, Hamilton, was elected president; Drs. Thomas A. Grigg, Butte, John L. Treacy, Helena, and Arthur C. Knight, Philipsburg, vice presidents; Dr. Elmer G. Balsam, Billings, secretary-treasurer (reelected); Dr. Creswell T. Pigot, Roundup, delegate, and Dr. Harmon T. Rhoads, Choteau, alternate delegate. The next annual meeting will be held at Lewistown.

NEW JERSEY

President of State Society Resigns.—Dr. Archibald Mercer, Newark, who was elected president of the Medical Society of New Jersey at the annual meeting, Atlantic City, recently resigned that position on account of impaired health. Dr. Lucius F. Donohoe, Bayonne, first vice president, became the acting president of the society.

Personal.—Dr. Harold E. Longsdorf, Mt. Holly, has been appointed medical director of the Burlington County Hospital at Mt. Holly to succeed the late Dr. Elmer D. Prickett.——Dr. Wells P. Eagleton, Newark, sailed from San Francisco, July 18, for a trip around the world by way of the South Sea Islands, Australia and India. He will return the latter part of December.——Dr. Obadiah H. Sproul, Flemington, celebrated his eightieth birthday, recently. Dr. Sproul was president of the state medical society in 1894, and has attended every annual meeting except two in the last sixty years.——Dr. Thomas J. Smith, Bridgeton, who has been a member of the staff of the Bridgeton Hospital since its organization in 1898, has resigned.——Dr. Charles B. Kelley, Jersey City, has been appointed a member of the state board of medical examiners to fill the vacancy caused by the death of Dr. John J. Mooney.——Dr. Lancelot Ely, Somerville, has been promoted from major to lieutenant colonel in the Medical Officers' Reserve Corps.

NEW MEXICO

Report of Sanitary Engineer.—The semiannual report of the sanitary engineer of the bureau of public health shows that there are thirty-eight municipal water supplies and twenty-one sewerage systems in the state. Two towns have voted bond issues to construct water systems and one to install a sewer system. Four other towns provided funds to extend and improve their water supplies. There are seven water supply systems and five sewerage systems maintained by mining companies for the use of their camps. Thus, forty-seven towns in the state have, or will have, protected drinking water and only twenty-seven will safeguard their sewage disposal. These systems are under the supervision of the state bureau of public health, which also inspects, in cooperation with the federal government, water supplies maintained by railroads for the use of their passengers. A total of 120 inspections were made in the last six months with eighteen recommendations for improvements. The report shows that twenty public swimming pools are supervised by the state board of health. As distances in this state prevent shipping milk to the state public health laboratory for examination, the sanitary engineer recommends that a traveling laboratory, mounted on a small truck, be provided for the purpose of examining water and milk supplies.

NEW YORK

Typhoid Fever at Port Jefferson, L. I.—A report, August 14, states that in the preceding week thirty cases of typhoid fever were reported to the health department. The first cases were reported, August 8, and within twenty-four hours twenty cases had been reported. Local and state health officials are cooperating to determine the source of the epidemic. It is stated that a case of typhoid fever was discovered among the employees of a local dairy and that the milk supply from this dairy has been ordered discontinued.

Clinics for Poliomyelitis Victims.—The state department of health held thirty-five clinics the first half of this year for the after-care of persons crippled by infantile paralysis, a total of 655 patients attending. It is reported that there are 1,795 patients under state supervision, of which 1,262 were attached since 1916, the year of the latest severe epidemic, and only 533 prior to that time. In addition to examination and treatment offered by the state department of health to these patients, provision has been made whereby apparatus, special shoes and braces may be obtained through the department on the partial payment plan; 173 pieces of apparatus were thus supplied during the first six months of this year.

Periodic Health Examinations.—The New York State Committee on Tuberculosis is promoting its campaign for periodic health examinations by arranging appointments for examination by means of a printed card, the effectiveness of which has been shown at business men's clubs. About 80 per cent. of the men at the luncheon meetings sign cards that have been placed at each plate for a definite appointment for a physical examination. The signed cards are returned to the secretary of the local committee, who arranges the appointment with the designated physician to whom a health examination blank is furnished. The cards will be kept on file by the secretary, and the signer reminded each year of his duty to call for his physical examination.

Infantile Paralysis at Syracuse.—The two cases of infantile paralysis reported, August 13, at Syracuse, made a total of 63 cases since June 5. The state department of health states that infantile paralysis for 1924 seems to be definitely centering about the city of Syracuse. This city was comparatively free from the disease last year but constituted a well marked center in 1922. The initial cases were children of Italian families who lived within three blocks of the Erie Canal. It is interesting to note that the epidemic of 1916 in New York City began among Italian children who lived near the old Gowanus Canal in Brooklyn, and likewise the epidemic of 1921 in Utica began among Italian children who lived near the old Erie Canal bed. A second focus of infection is developing in Oswego, where of the six cases reported up to August 1, four appeared to be children of Italian parents. Cases are appearing in considerable number much earlier than at any time since 1916 in both Oswego and Syracuse.

New York City

Physician Held.—It is reported that Dr. Hadley T. Cannon, 29 East Eighty-Third Street and 1111 Madison Avenue, was held in $3,500 bail, August 8, charged with homicide in the death of Miss Maloney following an illegal operation. Dr. Cannon, who formerly practiced in Binghamton, was indicted there last October on a similar charge, but was released on bail and never brought to trial.

Information on Postgraduate Medical Education.—The Clinical Bureau of Information of the New York Academy of Medicine has been collecting data from hospitals and clinics of Greater New York for a booklet for the guidance of physicians interested in the local facilities for postgraduate clinical study. The bureau has also taken over and is expanding the work started years ago by the New York Association for the Development of Postgraduate Medical Education. It plans to collect information with reference to opportunities for clinical postgraduate work in large cities of the United States, England and on the continent. Several of the foreign clinics are now regularly supplying the bureau with data as to their schedule of work and facilities.

Clinics to Care for Teeth.—In a report recently published by the dispensary development committee of the United Hospital Fund, an appeal is made for preventive dental work among school children. The report states that there is an enormous amount of dental work needed in the city and that about nine-tenths of the school children do not brush their teeth daily. It is estimated in the report that to meet the dental needs of New York City would require 12,000 dentists working full time throughout the year, whereas the city has 5,000 dentists. The most serious need shown by the report is clinics for school children in which preventive dentistry is done. The second need is for extending dental service through organized clinics that would do work at cost for self-supporting patients on a basis of service rather than of charity. There are at present only about 100 dental clinics in this city, mostly small and confined to special kinds of work. The report was written by Michael M. Davis, Jr., and Clare Terwilliger of the staff of the committee on dispensary development and is endorsed by a committee of dentists and other specialists and by the oral hygiene committee of New York.

Health Service for the Preschool Child.—Plans for a health service for children between 2 and 6 years of age have been completed by the New York Association for Improving the Condition of the Poor. They are based on plans used in the Mulberry district, where to reach children likely to enter school in the autumn, the school principals of the district sent to the Association for Improving the Condition of the Poor the addresses of all children of preschool age who had brothers and sisters in the schools of the district. The association offered to provide follow-up nursing for such children referred to them. The health department has assigned one of its physicians to the Mulberry Health Center three times a week. Examinations were conducted for six weeks, beginning May 1. Of 700 children referred to the health center from the school district, 612, or 79 per cent., were given a complete physical examination, and 236 were ready for admission to schools in the autumn. Of another group of 593 children who entered the schools and who had no older brothers or sisters in school, only fourteen had been referred to the association for examination. This plan not only provides for the preschool child but is a help to the board of education and to the health department.

NORTH CAROLINA

More Asheville Physicians Arrested.—It is reported that Dr. George W. Purefoy, Dr. Morgan P. Moorer and Dr. Ptolmey P. Chambers, all of Asheville, have been arrested for violation of the Harrison Narcotic Law since the raid of July 31, at which time federal agents arrested three other physicians on a similar charge (THE JOURNAL, August 9, p. 449).

OHIO

Smallpox at South Solon.—It is reported that nine persons, members of two families which occupy the same house, are ill with smallpox at South Solon.

Cardiac Clinic.—The Marion County Medical Society is making arrangements for a clinic on "the prevention of heart disease," to be held at Marion, October 7, at which Dr. Filmore Young, Marion, and his associates will present fifty cases of heart disease. Dr. S. Calvin Smith, Philadelphia, and others out of town, will be in attendance at the clinic.

Charges Preferred Against Chiropractors.—Frank L. Dorsey, examiner for the state medical board, it is reported, has filed affidavits against the following chiropractors of Portsmouth for practicing without a license: W. H. Spring, O. A. Knechtly and his wife, and D. D. Owen. The Knechtlys and Owen were arrested about a year ago on similar charges.

Physician Arrested.—It is reported that Dr. John F. Holtz, Shelby, was arrested, July 28, by state prohibition agents for illegally issuing prescriptions for intoxicating liquor, and that the majority of the prescriptions in question were filled by a drug store in Chicago for trainmen who, in some cases, were not the men to whom the prescriptions were originally issued.

Personal.—Dr. Walter S. Weiss, Jefferson, has been reappointed county health officer of Ashtabula County for a term of two years.——Dr. James R. Echelbarger, Ottawa, has been appointed coroner of Putnam County to fill the vacancy caused by the death of Dr. Albert F. Sheibley.——Mr. Carl A. Brimmer, formerly assistant superintendent of the Toure Infirmary Hospital, New Orleans, has assumed the duties of superintendent of the Mansfield General Hospital, Mansfield.

OKLAHOMA

New Medical School Building.—A building is being erected for the University of Oklahoma School of Medicine at Norman, which, it is expected, will be ready for occupancy late in November. It will be Gothic, three stories high, of concrete, brick and Bedford limestone, and will house, on the first floor, a museum and library, bacteriology and pathology laboratories and lecture rooms; on the second floor, laboratories and offices for physiology and biochemistry; and, on the third, laboratories for gross and microscopic anatomy. Each

department will have research rooms and the equipment of the entire building will be modern and complete. This is the first unit of a three unit structure that will be completed when funds are provided.

OREGON

Hospital News.—A new two-story addition will be erected to the Portland Sanatorium, Portland, at a cost of $15,000. The new addition will conform to the design of the original building.

PENNSYLVANIA

Personal.—Dr. Hamilton C. Wallace, Pottsville, has been appointed president of the board of health to succeed Dr. Henry A. Dirschedl.

Chiropractor Jailed.—Walter B. Martindell, a chiropractor of Bristol, was recently fined $500 and sentenced to serve six months in the Bucks County jail for practicing without a license. About two years ago, Martindell was fined $300 on a similar charge. In refusing Martindell a new trial after his second conviction, Judge Ryan said: "My duty to the commonwealth and law of this state compels me to send you to jail. I think any intelligent man would realize that the law under which you have been convicted in this state is constitutional, especially when the highest court of the land upholds the decision."

Smallpox in Pittsburgh.—Two deaths from smallpox in Pittsburgh, August 7, made a total of fifteen for this year. Due to the improvement in the smallpox situation in the city, it has been decided not to make further use of warning signs and not to continue more than six vaccination squads which will be confined to the neighborhood in which cases appear. The twenty vaccination clinics will be continued and extended to outlying localities, if necessary. The Allegheny County Medical Society's bulletin issued in behalf of the vaccination campaign shows that of the eighty-eight cases of smallpox admitted to the Municipal Hospital up to July 31, eighty-one of the patients had never been vaccinated.

Philadelphia

Hospital News.—Ground was broken, August 4, for the new Emma Shaperkotter Maternity Wing of the Women's Homeopathic Hospital, Twentieth Street and Susquehanna Avenue. The wing, which will be three stories high and contain forty-one beds, was named after a former treasurer of the hospital, and will cost about $250,000.

Personal.—Dr. Francis V. Gowen, Philadelphia, has been appointed instructor in laryngology in the Graduate School of Medicine of the University of Pennsylvania.——Dr. Elizabeth G. Bradt has been elected superintendent of the Woman's Southern Homeopathic Hospital.——Dr. Leopold S. Vaccaro has been made official chevalier of the crown of Italy by the king, in recognition of his services to that country. Dr. Vaccaro is director of the Italian Child Clinic, Tenth and Kimball streets, an instructor at the University of Pennsylvania School of Medicine, and a member of the staffs of the Pennsylvania, Babies' and Methodist hospitals.

RHODE ISLAND

The Hamilton Bill.—The house of representatives of Rhode Island has passed a bill amending the present law so that children 14 years of age may be examined by the superintendent of schools, and, if found incapable of making further educational progress in school, and if physically fit, may receive permits to work. This, the Hamilton bill, was reported favorably by the committee on education in spite of opposition, at a public hearing, of many welfare organizations and many prominent persons. At the last meeting of the house of delegates, the Rhode Island Medical Society unanimously passed a resolution condemning this bill. The *Rhode Island Medical Journal* (August) states that if the Hamilton bill is passed, it will be a step backward, and a definite move on the part of the state to shirk certain responsibilities. A better plan, the journal says, would be to follow the suggestions of the Peck bill which provides for special courses of training for backward children along the lines suited to their capabilities with a view to making them self-supporting citizens.

SOUTH CAROLINA

City Sells Its Laboratory.—The Purity Laboratory, Greenville, has been sold by the city board of health to private interests. The laboratory, established more than a year ago, was inaugurated with the view of furnishing scientifically prepared foods for infants, as well as general dairy products. The sale was undertaken after the board of health had heard complaints from dairymen against the city for engaging in business in competition with citizens.

Mortality Statistics: 1923.—The Department of Commerce announces that the 1923 death rate for South Carolina was 1,185 per hundred thousand population as compared with 1,202 in 1922. This decrease in 1923 is largely accounted for by the decrease in the death rates from malaria, with a rate of 15 as compared with 29 in 1922; pellagra, with a rate of 19 as compared with 25 in 1922; typhoid fever, with a rate of 18 as compared with 23, and homicide, with a rate of 11 as compared with 14. Notable increases in 1923 appear in the death rates from measles, from 1 to 12; whooping cough, from 8 to 15, and automobile accidents, from 4 to 7.

TENNESSEE

Personal.—Dr. Stanley R. Teachout, Nashville, was elected chairman of the county board of health at a reorganization meeting, July 26.

The Knoxville Epidemic.—The epidemic of typhoid fever in Knoxville, it is reported, had on August 3 amounted to seventy-nine cases and five deaths. The city health officer, Dr. Marvin F. Haygood, is reported as saying that the seriousness of the situation is not understood and that placards on springs have been torn down and the water used regardless of warning. The city has purchased typhoid vaccine for 6,000 persons and has funds available to buy more.

TEXAS

Typhus Fever.—Acording to *Public Health Reports*, the state health officer of Texas reported nineteen cases of typhus fever during the week ended, July 12. There were two cases reported from Rio Grande City, July 21.

VERMONT

Personal.—Dr. James Haylett, Moretown, who recently celebrated his eightieth birthday, was presented a loving cup by his friends in memory of his fifty-five years in medical practice.

VIRGINIA

Branch Laboratory at Harrisonburg.—The state board of health has opened a branch laboratory at Harrisonburg which is operated jointly with the Rockingham Memorial Hospital. It is supported by funds from the hospital, from the state board of health and from the International Health Board. All kinds of work, except the Wassermann test, that is done at the central laboratory, Richmond, will be done at the branch at Harrisonburg.

Personal.—Dr. Robert Bruce James, Danville, has been appointed a member of the board of visitors of the Virginia Military Institute at Lexington for a period of four years.——Dr. Robert H. Courtney, Richmond, has been appointed a member of the governor's advisory board for mental hygiene.——Dr. Charles Phillips, formerly professor of pathology at Wake Forest College School of Medicine, Wake Forest, N. C., has been appointed professor of pathology at the Medical College of Virginia, Richmond.

Children's Clinic Opened.—The Children's Memorial Clinic, Richmond, was formally opened, August 7, with Dr. Basil B. Jones, medical director and head of the pediatric department. The clinic has been organized to carry into effect recommendations in the child welfare laws passed by the General Assembly, 1922, which provide that children under the care of institutions be given a thorough mental and physical examination. The clinic has therefore a pediatric and a neuropsychiatric department. The Commonwealth Fund which cooperated with the social agencies of Richmond and Virginia in organizing the clinic, will provide $12,000 for the first annual budget. The clinic will make possible the examination of every school child as well as those committed to an institution, and will, in fact, be a clearing house for children's health problems for Richmond.

WISCONSIN

Library Offer Declined.—The *Wisconsin Medical Journal* says that a tentative offer to present the medical library of 17,000 volumes of the Milwaukee Academy of Medicine to the Milwaukee Public Library has been declined. The city considers that it could not adequately house these volumes.

Aliens May Take State Board Examinations.—According to an opinion of the attorney general, July 28, the state board of medical examiners cannot enact a rule to exclude alien

physicians from taking the examination in this state. He said in part:

> Neither do I find any statute which expressly, or through implication, gives the board the power to enact a rule requiring a practitioner to be a citizen of the United States. The rule above referred to is in excess of the powers granted to the board; in effect, it would be legislation on that subject, and no legislative powers have been or can be delegated to an administrative board.

Personal.—Dr. Ebba A. Dederer, Rome, N. Y., has been appointed superintendent of the Wisconsin Industrial Home for Girls at Taycheedah by the state board of control. Dr. Dederer has been connected with the Rome State School for Girls in New York, and will assume her new duties, September 1.——Dr. Carl Arthur Hedblom of the Mayo Clinic, Rochester, Minn., has been appointed chief surgeon of the Wisconsin General Hospital, and professor of surgery at the University of Wisconsin Medical School, Madison. Dr. Hedblom, who has been in charge of thoracic surgery at the Mayo Clinic, graduated from Harvard in 1911 and received a Ph.D. degree from the University of Minnesota in 1920.——Dr. Richard F. Werner of Eau Claire has presented to the town of Sampson a 13 acre park on Round Lake.——Dr. George W. Harrison, Ashland, has been appointed county physician to succeed Dr. Adellon Andrus.

Attorney General Upholds Prohibition Commissioner.—In a recent opinion the attorney general upheld the rulings of the prohibition commissioner with respect to permit fees for the purchase, prescribing and use of alcoholic beverages. The commissioner, according to this opinion, is acting within the law in charging a permit fee of $10 for the privilege of issuing prescriptions, another $10 for the privilege of purchasing liquor for emergency medical purposes, and another $10 for the privilege of purchasing alcohol for other than sterilization purposes. Counsel for the State Medical Society contended that purchasing liquor for emergency medical purposes was, in effect, the same as issuing a prescription, and that one $10 fee should cover both privileges. This contention was denied. The state medical society, at the convening of the next legislature, will make an effort to change the state law to conform to the federal law on the subject.

CANADA

Gift to Kingston Hospital.—The governing board of the Kingston General Hospital has announced that by the will of the late Charles Sandwith Campbell, a lawyer of Quebec, the Kingston General Hospital has been bequeathed about $300,000 for the extension and maintenance of that institution.

Toronto Academy of Medicine.—Following the last annual meeting, the Toronto Academy of Medicine entered its eighteenth year with a total fellowship of 756, of which 642 are resident fellows, and an annual income of more than $10,000. Its library contains 15,150 volumes, an increase of 1,400 during the year.

GENERAL

Personal.—Dr. Joseph F. Montague, New York, secretary of the American Proctologic Society, returned, August 6, from London, where he read a paper before the proctological section of the Royal Society of Medicine on "Pruritus Ani."

Funds for Antivivisection Propaganda.—Acording to *Colorado Medicine* the New England Anti-Vivisection Society has received, in the last twenty-seven years, more than $78,000 from twenty-one different legacies. All but one of the legators were women.

Hospital Expense Record.—The average daily cost per patient in 1923 at the City Hospital, Indianapolis, was $3.50, a sum at least 60 cents lower than that of any other hospital of the same classification in the country, according to a report of the superintendent, Dr. Cleon A. Nafe. The daily average number of patients was 329 and 66 per cent. of them were on a charity basis.

No Chemical Exposition This Year.—The International Exposition Company, under whose management the Exposition of Chemical Industries has been held since 1915, has announced that it was decided last year to skip 1924 and to hold the next chemical exposition in the Grand Central Palace, New York, September 28-Oct. 3, 1925. From the inquiries received, it appears that many persons are of the opinion that an exposition will be held this year.

Examination Date Postponed.—The U. S. Civil Service Commission announces the postponement from August 20 to Sept. 20, 1924, of the closing date for the receipt of applications for the competitive examination for physicians for filling vacancies in the U. S. Veterans' Bureau throughout the states of Missouri, Kansas, Oklahoma and Arkansas, at entrance salaries ranging from $2,400 to $5,500 a year. Information concerning this examination can be obtained from the secretary, Ninth Civil Service District, St. Louis.

Fund for Museum in Yellowstone Park.—A grant of $75,000 by the Laura Spellman Rockefeller Memorial has been made to the American Association of Museums as custodian for a museum in Yellowstone National Park, $50,000 of which will be for a building, $10,000 for equipment, $10,000 for personnel for the building for three years, and $5,000 for the expenses of the committee. It is expected that the National Park Service, during the initial period of three years, will gradually absorb the program. The museum building will be designed to harmonize with the administration and postoffice building, now under construction by the government, and there will be four main groups of exhibits: geologic, zoologic, botanic and ethnologic.

Annual Safety Congress.—The thirteenth annual safety congress of the National Safety Council will be held at Louisville, Ky., September 29-October 3. Among many others, the following addresses will be presented: "Industrial Health as a Purchasable Commodity," Dr. Clare F. N. Schram, medical director, Fairbanks Morse and Company, Beloit, Wis.; "Health Education of Our Foreign Families," Dr. Amos W. Colcord, Carnegie Steel Company, Clairton, Pa.; "How to Make a Sanitary Survey of an Industrial Plant," Dr. Charles L. Ferguson, Shelby Shoe Company, Portsmouth, Ohio; "Report of Committee on Benzol Poisoning," Charles Edward A. Winslow, Dr.P.H., New Haven, Conn.; "Prevention of Lead Poisoning" (roundtable discussion), Dr. Wade Wright, assistant medical director, Metropolitan Life Insurance Company, New York, and Frederick L. Hoffman, Babson Institute, Wellesley Hills, Mass.; "How a Medical Department May Contribute to Safety in the Chemical Industry," Dr. Benjamin J. Slater, Eastman Kodak Company, Rochester, N. Y.

Southwest Fall Clinical Conference.—The conference this year will be held in Convention Hall, Kansas City, Mo., October 13-18. It will include meetings of the Medical Association of the Southwest, October 13-14, the American Child Health Association, October 14-16, and the Kansas City annual fall conference. The plans comprise clinics in the morning at hospitals, scientific programs each afternoon, and public meetings in the evening. There will be a combined meeting, Tuesday evening, October 14, of the Medical Association of the Southwest and the American Child Health Association, with Secretary of Commerce Herbert Hoover, president of the American Child Health Association, presiding. President George E. Vincent, Rockefeller Foundation, New York, and Surg.-Gen. J. H. Cumming, U. S. Public Health Service, will speak. On Thursday evening, October 16, Surg.-Gen. Merritte W. Ireland, U. S. Army, will address a medical military public meeting. Distinguished guests from various parts of the country will take part in the scientific program. There will be an unveiling of a bronze tablet at the Bell Memorial Hospital in memory of Lieut. William T. Fitzsimmons, Medical Corps, U. S. Army, by Surgeon Generals Ireland and Cummings. Lieutenant Fitzsimmons was the first American officer killed in the World War. The U. S. Army General Hospital, Denver, is named in his honor.

Misleading Conclusion Concerning Mortality.—For some time after 1910, there was comment about an increase of the death rates in middle life over the figures for 1900 in which it was said that the strain of modern ways of living was taking a heavier toll than formerly among people in the prime of life. That such conclusions may have been premature is indicated by facts collected by the Metropolitan Life Insurance Company on the mortality in New York state between the ages 45 and 64 years for the period 1900 to 1922. These facts show that for this age period there was a drop of 10 per cent. in the death rate for males and of 11.6 per cent. for females. While most of the improvement in the death rates at this age division seems to have been due to the lowered mortality from tuberculosis and pneumonia, further decline in the death rate at this life period may be expected from the remarkable reduction in the last twenty years in acute infections among young people. As these persons enter the age period beyond 45 there will be fewer damaged hearts, blood vessels and kidneys and, consequently, lower death rates from endocarditis and other results of sepsis. The practice of identifying and treating focal infections and the campaign for periodic physical examinations will make for further gains at this age period. These facts covering a twenty-two year period show that misleading conclusions can be drawn from insufficient data which cover only parts of a calendar period

FOREIGN

Medical Congress of Latin Peoples.—A committee headed by the dean of the Paris medical faculty is now at work on an Inter-Latin Nations Medical Congress to convene in June, 1926, probably at Paris. The official addresses will be on medicosurgical topics requiring laboratory aid.

The Medical Meetings at Innsbruck in September.—The German Pediatrics Society convenes at Innsbruck, September 18-20. "Tuberculosis in Children" is the subject chosen for discussion. The eighty-eighth annual meeting of the German Society for the Advancement of Science, the Naturforscher Congress, opens, September 24, with a scientific exhibit in connection.

Ninetieth Anniversary of the Antwerp Medical Society.—The gala meeting on this occasion was distinguished further by the celebration of the fiftieth professional anniversary of Dr. Van Vyve, who was presented with a souvenir volume containing the scientific works that had been published by thirty-two members of the society. Professor Gunzburg presided at the meeting and the concluding banquet.

The Internal Research Institute at Davos.—In the fiscal year just closed, twenty-seven research workers took advantage of the opportunities afforded by the Davos Forschungsinstitut in charge of Professors Loewy and Dorno. The work done was mainly in the lines of chemistry and physiology, and some of the reports have already been published. After Oct. 1, 1924, there will be a few posts vacant.

The Charcot Centennial.—The centennial of Charcot coincides with the twenty-fifth anniversary of the founding of the French Société de neurologie, and is to be celebrated by the Réunion annuelle de neurologie, announced for June, 1925. Two topics have been selected for discussion: "Migraine," to be introduced by V. Christiansen of Copenhagen and Pasteur Vallery-Radot of Paris, and "Charcot's Disease" by V. Neri, Bologna; Van Bogaert, Antwerp, and I. Bertrand, Paris.

Ireland's Physicians Want More Pay.—At the recent annual meeting of the Irish Medical Association, the president, Dr. William O'Sullivan, Killarney, drew attention to the small pay of the dispensing physician in Ireland, it is reported. He said that they were treating more than 2,000,000 people in the Free State under the Medical Charities Acts, for which they received about $80,000, and that no other country in the world paid so little. The association passed a resolution expressing the hope that no change would be made in the system of medical registration in Ireland which would interfere with the rights of qualified physicians to practice in Great Britain and its dominions.

Personal.—Mr. R. W. Harris has been appointed, by the board of management, secretary of the London School of Hygiene and Tropical Medicine. Mr. Harris was formerly an assistant secretary of the ministry of health.——Sir John Bland-Sutton, president of the Royal College of Surgeons, sailed from Liverpool, August 9, for New York.——Profs. A. Martinez Vargas, rector of the University of Barcelona, and E. Suñer of Madrid have been elected corresponding members of the Paris Société médicale des hôpitaux.——Dr. Casares, dean of the pharmacy medical faculty at Madrid, has had an honorary degree conferred on him by the University of Munich.——The university authorities at Vienna have decided that Professor Hochenegg is not to be disciplined for his statement in a lecture in regard to the prevalence of fee-splitting in Vienna, as the organized profession demanded. The university authorities stated that they considered that Hochenegg's statements had not been made heedlessly, and that it is within his province to discuss ethical questions with his students.

The Schiffers Case.—The *Scalpel* of Brussels publishes, by legal decree, the decision in the suit brought by Professor Schiffers of Liége in the Seine civil court against Professors Lannois, Lermoyex, Moure and Sebilleau, and decided in his favor. In 1909, the defendants wrote to the plaintiff asking him to collaborate in a manual on otorhinolaryngology, saying that his name would appear on the title page. When the first volume appeared, his name was not on the title page, and the articles he had sent for the second volume were returned to him, as it had been decided to use only the work of French writers. The court decreed that the defendants must recall the copies of the first volume that had been issued, and substitute a title page bearing the name of Schiffers. Also, that the articles written by the plaintiff at the request of the defendants must be inserted in the second volume now under way, and that the name of Schiffers must appear on the cover. The defendants were assessed the costs of the suit, and of the publication of the decree in full in two Belgian medical reviews or journals selected by Schiffers.

Cost of Disease in India.—Christophers, in the *Indian Medical Gazette*, says that, among the 360,000,000 people in India, 7,000,000 die annually. In England, 530 of every 1,000 persons born reach the age of 50, but in India only 186 reach that age. The cause of this difference is the incidence of disease in the early life periods. There is a loss of twenty-one years' expectation of life in the first year of existence in India, and a loss of nineteen years in the age period from 3 to 5. In the malaria outbreak in the Punjab in 1908, 20,000,000 people were simultaneously affected, of whom a quarter of a million died. Analyzing the report of the public health commissioner for 1921, the author says that cholera, smallpox and plague caused 600,000 deaths; diarrhea and dysentery, 200,000; respiratory diseases, 300,000, while "that convenient dump for undiagnosed maladies," the fevers, accounted for nearly 5,000,000. He points out the penalty the country pays for a bad sanitary reputation, and says that the important matter seems to be that the government should hold enlightened views as to what should be done to justify its trust so far as the prevention of disease is concerned. But no government, however enlightened, can combat disease without knowledge, and were it prepared to spend vast sums on public health, its efforts would be nullified without the contributions of medical research, on which sanitation and medical relief are based, and without which they are powerless to advance.

Deaths in Foreign Countries

Edmund Comer Board, Bristol, Ireland; formerly lecturer on forensic medicine and president of the Bristol branch of the British Medical Association, aged 85.——Dr. **E. Fidanza,** medicolegal expert, Buenos Aires, treasurer for thirty years of the Argentine Medical Association and of the various medical congresses in Argentina.——Dr. **J. Gorrochategui,** surgeon inspector of the Argentine navy. He accompanied the Nordenskiold polar relief expedition, and during the World War was detailed to the U. S. North Atlantic fleet. ——Dr. **A. R. Cohen** of Amsterdam, founder and long president of the organization formed to improve conditions in contract practice in the Netherlands.—Dr. **A. Opisso,** Madrid, medical collaborator for many years on a local daily. ——Dr. **J. Escat,** professor of urology at the University of Marseilles.——Dr. **Leo Stuckey,** surgeon in charge of the Obuchow and later of the Alexander Hospital at Leningrad, author of numerous works on surgery, has been shot by the brother of a girl who died from uremia five days after an operation for chronic appendicitis. The parents had brought suit against him, but it had been dismissed, as there was nothing to incriminate the surgeon.——Dr. **Rowe,** physician in charge of the Görbersdorf Sanatorium, was one of the group of two officials and two private patients who died during a recent wholesale poisoning with paratyphoid bacilli from a dish made with strawberries. Nearly 240 persons were affected.

Government Services

Veterans' Bureau Appointment

Dr. M. B. MacMillan has been appointed, by the director of the Veterans' Bureau, community manager of Rehabilitation Center No. 2, Perry Point, Md. Dr. MacMillan was director of field hospitals in France with the forty-second division, and served in the Spanish-American War with the army of occupation in Cuba.

Trainees in Military Camps

The war department has announced that 33,544 trainees have been in attendance this year in the various citizen's military training camps conducted throughout the United States. The total in 1923 was 24,000; 22,000 in 1922, and 11,000 in 1921.

The number this year from each corps area was: First corps area, with headquarters at Boston, 2,747; second corps area, New York, 4,612; third corps area, Baltimore, 3,820; fourth corps area, Atlanta, 3,869; fifth corps area, Columbus, 3,956; sixth corps area, Chicago, 3,605; seventh corps area, Omaha, 4,748; eighth corps area, San Antonio, 3,254, and ninth corps area, San Francisco, 2,933.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 28, 1924.

Clean Milk

The results of several years' research work into the methods of handling milk supplies are contained in a booklet of the ministry of agriculture, just published. Experiments with grade A (certified) milk, or milk from cows that have failed to react to the tuberculin and bacteriologic tests, have shown that under ordinary conditions it may be expected to remain sweet for from two and a half to nine and a half days from the time of milking. This supports the view that a delivery once a day should suffice, even in the large cities; but with milk of a lower grade it is admitted that, owing to methods of handling and the length of journeys, difficulties may arise in hot weather. To meet these, it is suggested either that there shall be more deliveries so as to insure that consumption in a consumer's house shall have ceased when the milk is not more than thirty-six hours old, or that there shall be more efficient cooling at the farms and during transit. The question of transit raises the whole problem of the cleanliness of utensils, for some of the troubles of the dairy farmer in this respect are due to the milk dealer, whose duty it is to see that empty cans are adequately washed and steamed before they are returned. Of 500 empty cans tested on a station platform, 221 were clean and sweet, 123 contained no milk but had an "evil smell," and 156 either contained milk or were badly washed. This investigation proves that the present methods of washing and cleansing cans are inadequate, and are therefore a cause of loss of milk through souring in transit. The importance of clean milk, not only in the ordinary trade, but also in allied industries, is emphasized in the report of some studies in cheese making. In 1913 it had become evident that "dirt" organisms were at the root of the discoloration of Stilton cheese, and later work showed that yeasts were the cause of spoiled condensed milk, and that yeasts acting in combination with bacilli, which were capable of reducing lactose, were the cause of fruity whey and also of one form of gassy change in Cheddar cheese.

The Health of London

In his report for 1923, Sir William Hamer, health officer for London, says that the year 1923 was remarkable for having the lowest death rate (11.4) ever recorded in London. The infant mortality rate was even more exceptional, as it was only 61 per thousand births, a considerable fall from 75, the rate of the preceding year, which was itself a record rate. But the marriage and birth rates fell markedly:

Marriage and Birth Rates for London

	1920	1921	1922	1923
Marriage rate per thousand population.	22	19.5	18.4	17.2
Birth rate per thousand population....	26.4	22.1	20.9	20.1

Thus, in the four years since the war, the marriage rate has fallen by 22 per cent., and the birth rate by about 23 per cent. It is fair to add, however, that the rates for 1920 were both abnormally high. The highest birth rate is that for Shoreditch, which in 1923 was 27.1. The lowest (excluding the city of London) is Westminster. The sharpest decline in the birth rate between the three-year periods 1911-1913 and 1921-1923 occurred in Fulham (23.4 per cent.), the next largest in Bethnal Green (21.4 per cent.), and the smallest in Hampstead (1.1 per cent.). If the boroughs are grouped according to social condition as shown by the proportion of children of school age scheduled for attendance at elementary schools, it is found that the decline in the birth rate and infant mortality rate is greatest in those boroughs in which the proportion of children scheduled is highest. Thus:

Social Group	Decrease in Birth Rate, Per Cent.	Decrease in Fertility, Per Cent.	Decrease in Infant Mortality, Per Cent.
1.....	9.8	14.1	23.3
2.....	13.3	15.5	30.6
3.....	16.5	14.4	36.2

The low death rate among infants is ascribed to "the absence of epidemic influenza and a mild winter." Hamer emphasizes the influence of elementary education on the infant death rate. He declares that "the mother may be regarded, indeed, as practically constituting the environment of the infant." An educated mother is better able to care for her child than a mother who has not enjoyed this advantage. The following mortality table shows how enormously health and fitness have improved since 1841:

*Mortality Table, London**

	At Ages											
Males	0	5	10	15	20	25	35	45	55	65	75	85
1920-1922....	100	100	100	100	100	100	100	100	100	100	100	100
1841-1850....	244	333	245	225	239	248	226	185	163	170	136	121
Females												
1920-1922....	100	100	100	100	100	100	100	100	100	100	100	100
1841-1850....	258	330	238	218	234	265	264	214	193	170	149	133

* The figures for 1920-1922 are taken as representing 100.

Life Expectancy at Birth Now and at Earlier Periods

Period	Life Expectancy (Years) Males	Females
1841-1850.....	34.6	38.3
1851-1860.....	36.4	40.4
1861-1870.....	35.7	39.9
1871-1880.....	38.0	42.4
1881-1890.....	40.1	44.5
1891-1900.....	41.2	45.4
1901-1910.....	47.2	51.9
1911-1912.....	49.5	54.5
1920-1922.....	53.8	59.1

Thus, in the course of eighty years the Londoner's lifetime has been extended by more than twenty years—males by 19.2 years and females by 20.8 years.

Hamer has followed the course of influenza in London with care, and says that during the last two years, at any rate, influenza in one or more of its phases has been endemic in London. He holds that epidemic (lethargic) encephalitis is "the protean influenza, now not merely 'in mufti,' but changing from one civilian garb to another under our eyes, and demonstrating unmistakably that the more it changes the more it is the same thing."

Extending Compensation for Silicosis

With the object of amending the law with regard to workmen's compensation to give effect to the recommendations of the first report of the Departmental Committee on Compensation for Silicosis, a bill has been introduced in the house of lords. A memorandum issued with the text of the bill states that the committee found that the presence of silicosis in any degree renders the workman specially liable to tuberculous infection, and that in the great majority of mixed cases the silicosis precedes the tuberculosis and predisposes to it. The committee recommends that, subject to power being given to the medical officers to suspend from employment a workman found to be suffering from tuberculosis (without silicosis) or found at the first examination not to reach a prescribed standard of physique, patients with the combined disease should be compensated and otherwise dealt with in the same way as those with pure silicosis.

Exposure of Yadil

In previous letters, the methods used to exploit Yadil, a widely advertised nostrum, were discussed. To the evident consternation of the proprietors, the newspaper with the greatest circulation in England, the *Daily Mail*, has begun a campaign of exposure against it. This is a welcome innovation in the journalism of this country, for even the most respectable organs advertise nostrums, however exaggerated the claims made for them; and when the British Medical Association published "Secret Remedies," many of the leading papers refused to review it. It is curious that this departure should have been made by the *Daily Mail*, for, notwithstanding its huge circulation, its political tone is often low and it is regarded by its critics as eminently "yellow." The exposure begins with a long article by Sir William Pope, professor of chemistry in the University of Cambridge. [This was dealt with in detail in the Propaganda department last week.—ED.]

Sir Thomas Horder has written to the *Daily Mail* commending Sir William Pope's exposure, although he is not so sanguine as to believe that even so damning a revelation will go very far toward curing the public of its credulity in regard to "patent medicines" in general. To him the chief significance of the incident lies in the fact that at last the public is beginning to undertake its own protection against quackery posing as medical science, a task heretofore left to the medical profession itself, incapable of any effective action for the reason that it was often accused in such a case of bias and self-interest. The success of a secret remedy is in proportion to the business acumen of its proprietors. In the case of Yadil, there has also been an effrontery which must be almost, if not quite, unparalleled in the annals of quack medicines. Putting the onus of the continuance of tuberculosis on the medical profession if it did not advise the use of Yadil was a masterpiece of impudence. It is not the incorrigibly credulous, whose credulity is often of the nature of a luxury, for whom justice demands protection; it is rather the anxious, the overwrought, the despairing, who have been falsely promised wonderful things. The poor save their last penny for a bottle of weak formaldehyd with a nauseous smell added. The busy physician must also be protected against erroneous statements and ingeniously worded documents issued in quasiscientific form, purporting to contain records of experimental cases treated scientifically, which are really only blatant advertisements.

PARIS

(From Our Regular Correspondent)

July 25, 1924.

The Fifth International Neurologic Congress

For the last five years, the Société de neurologie of Paris has organized every year an international neurologic congress devoted to the study of some live topic. The fifth congress dealt with "disseminated sclerosis," on which two papers were presented, by Prof. O. Veraguth of Zurich and Prof. Georges Guillain of Paris, respectively.

ETIOLOGY OF DISSEMINATED SCLEROSIS

Being a disease of adult life, disseminated, or multiple, sclerosis occurs usually in the 20-40 age group, although a few cases have been observed in which it developed after 40, while Guillain noted two cases in children aged 13. The geographic distribution of the disease is noteworthy; the disease occurs more frequently in Europe than in America. In Europe the incidence is greater in the northern countries; in the United States, in the Great Lakes region. In Japan it is of rare occurrence.

Although the infectious origin of the disease seems probable, there is as yet no common agreement on the question. Many authors believe that the pathogenic agent is a spirochete. It does not seem probable that there is any relation between disseminated sclerosis and syphilis. As for a possible connection between disseminated sclerosis and epidemic encephalitis, there are no well substantiated cases in which a causal relation could be shown to exist between the two diseases. The presence of somnolence in true disseminated sclerosis has, however, been established. As regards the spirochete that has sometimes been incriminated, Guillain recalls that Noguchi, after experimenting with eight samples of blood or cerebrospinal fluid from patients with disseminated sclerosis, stated that his results had been negative, whence he concluded that the suspected spirochetes are probably detached filaments from red corpuscles. Also the researches carried out by Marquezy at the Salpêtrière clinic on nine cases of disseminated sclerosis were negative. In not one of his experiments could he discover spirochetes—not in his experimental animals, nor in the cerebrospinal fluid of patients, nor in the nerve centers of dissected animal subjects.

Prof. J. A. Barré of Strasbourg stated that he had studied critically seventy-two cases of disseminated sclerosis in an endeavor to discover the possible causes of the disease. He noted as immediate antecedent conditions: typhoid fever, three cases; influenza, eight cases; pneumonia, one case; childbirth, two cases; traumatism, one case; exalted emotions, five cases. As more remote antecedent manifestations, he observed: anemia, one case; illuminating gas intoxication, one case; alcoholism, one case; traumatism, two cases; various chronic infections, six cases. In forty of the seventy-two cases, Barré found no pathologic antecedent.

Dr. Souques of Paris discussed the age of the subjects and the mode of onset in 100 patients with disseminated sclerosis. Three patients were under 20 years of age, fifty-four were between 20 and 30, and one patient was more than 50 years old. The onset was slow and insidious in seventy-three cases. In seventeen cases the attack was sudden. In ten cases the eyes were the first organs to be affected. The types that had an insidious onset began, in thirty-eight cases, with manifestations of fatigue or with paresthesias in the lower extremities; in thirteen cases, with paresthesias or with a feeling of discomfort in the arms. In two cases, the onset was attended by urinary phenomena; in two cases, by hemiplegia. In several cases, there was a facial paralysis, a trigeminal neuralgia, and, in twelve cases, vertigo was present. The types with a sudden onset began with signs of vertigo or occasionally with an immobilized state in which the subject could not move. The types that began with ocular manifestations presented diplopia in seven cases and temporary amaurosis in three cases.

DIAGNOSIS OF DISSEMINATED SCLEROSIS

In his paper, Professor Veraguth emphasized the difficulties surrounding the diagnosis of disseminated sclerosis. In the cerebral type of the disease, the predominance of certain symptoms may open the way for misconceptions. The purely ocular types are sometimes difficult to recognize, and are often overlooked for some time. In other instances, an onset associated with epileptic attacks may lead one to suspect essential epilepsy, until one discovers later a permanent Babinski sign, together with abolition of the abdominal cutaneous reflexes. Also the hemiplegic type of disseminated sclerosis may be difficult to diagnose. Likewise, the sequels of epidemic encephalitis have a peculiar onset which makes differentiation easy. Cerebral tumors are more easily confounded with disseminated sclerosis. Such an error is always regrettable from a practical standpoint. Confusion of disseminated sclerosis with congenital or familial affections is not so likely. In the predominantly cerebellar types, the differentiation between disseminated sclerosis, on the one hand, and cerebellar or paracerebellar tumors, on the other

hand, may require careful judgment, especially if, associated with disseminated sclerosis, there is a facial paralysis. Hereditary cerebellar ataxia and Friedreich's disease are much easier to differentiate, especially if the family history is available. The spinal types may present diagnostic difficulties: (1) in the types with high localization (Oppenheim's cervical or sacral type), and (2) in cases the onset of which is marked by intense pain and which simulate tabes—especially, if ataxia and bladder trouble are present.

THE CEREBROSPINAL FLUID IN DISSEMINATED SCLEROSIS

Prof. J. A. Barré and Dr. L. Reys (of Strasbourg) reported the results of examination of the cerebrospinal fluid in seventy cases of disseminated sclerosis. The fluid was modified in 60 per cent. of the cases. Hyperalbuminosis was present in 31 per cent., and hyperlymphocytosis in 42 per cent. of the cases. The Wassermann test was positive in three of these patients in whom syphilis was a concomitant disease. Guillain's colloidal benzoin reaction was often positive when the Wassermann test was negative. This discrepancy between the two reactions appears to be frequent in disseminated sclerosis and may constitute a useful sign, but it has been noted also in certain cases of cerebral tumor.

International Cooperation in Intellectual Work

The Commission on Intellectual Cooperation, instituted by the League of Nations, plans to hold a session at Geneva, July 25-29, under the chairmanship of Prof. Henri Bergson. This session will be preceded by meetings of the three subcommittees appointed to deal, respectively, with questions of intellectual property, interuniversity relations and bibliography. The main topics on the program at these meetings are: the exchange of publications; the work of the International Bureau of University Information; the study of intellectual life in the various countries, and the replies from the various governments to the draft of the Italian senator Rufini pertaining to rights to scientific property, and the question of the coordination of bibliography in the realms of physics, physical chemistry and the social sciences.

An American Gift to the Sorbonne

Mr. Blumenthal of New York, as further evidence of his liberality toward French universities, has presented to the Sorbonne a gift of 250,00 francs.

Monument to the Memory of Prof. Raphael Blanchard

At Saint Christophe, his native city, a monument was recently unveiled in memory of Prof. Raphael Blanchard, who died in 1919. Addresses were delivered by Dr. Doléris, president of the Academy of Medicine; Prof. H. Roger, dean of the Faculty of Medicine of Paris; Professor Lapersonne, and others. The speakers referred to the progress that Blanchard had brought about in parasitology; the part that he had played in the establishment of the Institute of Colonial Medicine, in the Société de zoologie, which he helped to found and which he served for twenty-two years as general secretary, and in the Société d'histoire de la médecine, of which he was also one of the founders.

New Regulations with Respect to Milk and Its Derivatives

In order to give consumers of milk greater protection against the abuses, frauds and negligence of producers or venders, a recent ordinance establishes various regulations with reference to the sale of milk and milk products. The term "milk," without further indication as to the species of animal from which it is derived, may be used only of cow's milk. Milk from any animal other than the cow must bear a label indicating from what animal it is obtained; for example, the milk of goats, asses or sheep. As unfit for human consumption are designated: (1) milk from animals affected with any of the diseases named in the list prepared by the minister of agriculture on the basis of information furnished by the consultative committee on epizootics; (2) colored milk, unclean milk or malodorous milk; (3) milk secured under seven days after birth of young, and, as a general thing, milk containing colostrum; (4) milk from poorly nourished or manifestly overworked animals.

It will be considered as an attempt to defraud or as fraud to have in one's possession, to expose for sale or to sell, for human consumption, milk that is not reasonably clean for such usage, or mixed with milk that is not clean, milk obtained from incomplete milking, milk that has been skimmed or partially skimmed, unless, in the latter case, the containers bear a perfectly plain label: "skimmed milk."

"Butter" shall be understood as being produced by the churning of the cream from cow's milk, milk or its associated components, and must be sufficiently freed from the butter milk by working and lavage as to contain no more than 18 per cent. of nonfatty substances, of which no more than 16 per cent. may be water. The coloring of butter with vegetable colors and the salting with commercially pure salt up to 10 per cent. of its weight are permitted, provided such butter is marked "salted butter."

"Cheese" is the product obtained exclusively by coagulation, and by pressing milk, cream or skimmed milk. In the matter of cheese offered for sale, the following regulations shall be enforced: 1. Cheeses prepared from skimmed milk containing less than 15 per cent. of fatty substance after complete desiccation must not be sold unless they bear a stamp to the effect that they are *"maigre"*; that is, below standard as to fat content. 2. Cheeses prepared from other than cow's milk must bear a label indicating from what kind of animal the milk was derived.

Death of Dr. P. Lugeol

Dr. P. Lugeol, formerly obstetrician to the hospitals of Bordeaux, has died at the age of 85. Lugeol was born at Havana, Dec. 28, 1838, and in 1863 became an intern in the hospitals of Bordeaux. He became, later, obstetrician to the hospitals of Bordeaux, and while he was the director of the maternity department, through the introduction of Pasteur's methods, the statistics of this branch of the service became much improved. Lugeol took an active part in the creation of the medical syndicates, and, about ten years ago, he was elected president of the Association générale des médecins of the department of Gironde, the affairs of which he directed up to the time of his death.

Personal

The Academy of Medicine recently elected, on the first ballot, Dr. J. Camus, agrégé professor and head of the practical work in physiology at the Faculty of Medicine in Paris, as a corporate member of the section in biologic sciences.

PRAGUE

(From Our Regular Correspondent)

July 31, 1924.

Medical Education

The reform of medical education has again come to the front. The final plan is to be formulated by a committee in which all the medical faculties will be represented. It is probable that there will be no radical changes in the curriculum proposed by the committee. There seems to be a unanimous agreement that the study of medicine cannot be prolonged, and that all improvements in the curriculum must be made in the intensification of the studies. The practical education of physicians cannot be improved by changes in the plan of study, and it is well realized that this phase of the problem depends largely on the equipment of the medical schools. According to the present scheme, the medical studies

were divided into four semesters of study of normal conditions, while the six ensuing semesters were supposed to be devoted to the study of the sick. In actual practice, five semesters were spent on studies of normal conditions and only four on pathologic studies, owing to the distribution of the examinations. It is proposed to concentrate the studies of normal conditions into the first four semesters, and to use the fifth semester for the teaching of clinical propedeutics, the chairs for which have been established in all the medical faculties of the republic. This semester should be devoted to the teaching of clinical methods of examination, and the transition from the theoretical into clinical teaching made easier for the student. Another change is proposed in the form of examinations, which up to now were held in three groups of six examinations each. The examinations dealt with individual branches of medicine, and there was no effort to ascertain how far the teachings of the different branches of medicine have been correlated by the student. Therefore it is proposed to hold some sort of general examination at the conclusion of each of the three groups of the examinations. This examination should be attached to physiology in the first group, to pathologic physiology in the second, and to hygiene in the third. In this way it is intended to obviate the tendency of the students to study one subject for the examination, and forget everything about it as soon as the examination has been passed.

Council for Military Hygiene

An advisory council for military hygiene was recently established by a decree of the minister of national defense in the Czechoslovak Republic. The council consists of the chief of the army medical service as president, four ex-officio members, and eight ordinary members representing army medical officers, pharmacists, the ministry of health, the medical faculty of Prague, and other civilian organizations. The council is supposed to become an advisory body for the ministry of national defense for the scientific problems connected with military hygiene. It will be the task of the council to pass judgment on the new projects of the army medical service, follow the development of military hygiene in its scientific aspects at home and abroad, direct the professional library, suggest the ways and means for the further education of army medical officers, formulate the principles of army vital statistics, and establish a collection of standardized sanitary material and a hygienic museum. Two meetings of the council are to be held each month.

Ukrainians in Prague

The establishment of the Ukrainian university in Prague last year by emigrants and refugees from soviet Russia has been followed by a rapid development of professional activities on the part of Ukrainian medical men, who have concentrated in Prague around their teaching center. This meant not only a gain for the existing local medical schools because the presence of the Ukrainian professors and investigators led to an interchange of ideas, but also the organization of new bodies for the solution of medical problems. Recently the first meeting of the Ukrainian Biologic Society was held in Prague in the building of the Czech Medical School, where also the Ukrainian Medical School is housed under the leadership of the chemist, Prof. J. Horbaczewsky. A Ukrainian branch of the Masaryk League for the Combating of Tuberculosis was also recently organized for the purpose of stamping out the disease in Ukrainian emigrants who have taken shelter in the Czechoslovak Republic after their many hardships and sufferings.

Child Welfare

The Institute for Pedology in Prague, which has become an important center for research in the development of the child, will probably be affiliated in the near future with the anthropological institute of the Prague University. In the department for pedagogy of the institute, a mental test called the picture test has been developed by Dr. Herfort, who is the founder of the institute. In the somatologic department, children from a number of schools were studied in order to establish standards for the development of the body of the normal child. In the pedopsychologic department, records were devised for the tracing of the development of the intelligence of the child from the kindergarten to adolescence. The most popular part of the institute is its clinics for subnormal children, utilized not only by teachers but also by parents. The work of the institute has grown so extensive that it is seeking affiliation with the university, hoping that more funds may become available for the development of the work.

VIENNA

(From Our Regular Correspondent)

July 23, 1924.

The First Congress on Logopedia and Phoniatria (Diseases of Speech and Voice)

A few days ago, the first congress of students of the defects of speech, including laryngologists, neurologists, linguists and teachers, took place in Vienna and lasted three days. It was rather a daring enterprise, for the organizers were not sure of success. The majority of those present came from Austria and Germany, but there were students also from Italy, England, Greece and the Balkan countries. Docent Dr. Fröschels, who presided, pointed out that the treatment of the defects and disturbances of speech is closely connected with problems of medicine, psychology and education. He defined aphasia as "partial or complete loss of the faculty of speech (respectively of the understanding of speech) while the organs of speaking and the intellect are intact." He was satisfied that the old division of aphasia into sensory and motor aphasia was still the best; and he emphasized the value of dividing apperception into three types for the purpose of psychologic pedagogics: the visual, the acoustic and motor types. At present, students are not unanimous in localizing exactly in the brain the various manifestations of this condition. Dr. Hugo Stern spoke in memory of Gutzman, "father of phoniatria," whose endeavors to establish the entity of this branch of medicine were finally crowned with success.

Docent Allers and Dr. Freund reported on their investigations on the psychologic process of formation of words, which consists of a complicated series of psychic reflexes. Professor Winkler read a paper on hypnosis in relation to aphasia; he could produce at will aphasic symptoms in suitable mediums. The second main report was that by Professor Eliasberg of Munich, dealing with the "testing of the intellect with chief regard to the speech." Intellect is defined as the ability to adapt thinking to newly arising demands produced by new circumstances. By testing the faculty of speech of an individual and its adaptability to new requirements, one is able to discern by psychotechnic methods the qualities of applicants for certain posts. Dr. Stein presented a paper on universal stammering, or, as he terms it, "dysarthria universalis articulatoria." He maintains that the disturbances of speech, notable in persons affected in that way, are based on the same grammatical rules as control the formation of dialect or development of a given language.

On the second day, Professor Scripture of London showed his phonetic apparatus, by means of which he can ascertain and control the pitch of the voice of deaf-mutes, and thus use it for the teaching of such persons to talk. Incidentally, his apparatus can also aid the diagnosis of epileptic conditions. The chief report of that day was presented by Dr. Hoepfner of Saalfeld on stammering. He emphasized that under this

comprehensive denomination is understood a series of conditions that differ widely from one another in the view of pathologic anatomy and psychic conditions. He maintains that the majority of these cases belong to what he terms "associative aphasia"; i. e., a disturbance of the equilibrium of the child's psyche by the idea that it is unable to speak, which produces in its turn a defect of speech. In his report, Scripture pointed out that the psychologic factor is of paramount importance in such cases; the personality of the therapeutist, not his method, is decisive. The discussion that ensued lasted several hours. Drs. Fröschels, Stein and Gumpertz pointed out their experiences with patients of this type. They all agree that the psychic factor is of utmost importance, but they do not all coincide with the conclusions drawn by Dr. Hoepfner. Dr. Hugo Stern is of the opinion that in many stammerers a sudden "inability to make their voice audible" takes place. This is thus a "temporary associative aphasia," which is not very difficult to attack by therapeutic measures.

A number of papers by Rothe, Hoffman and Watzl dealt with the provisions for stammerers in schools. The institution of special classes for these handicapped children, thus separated from their fully capable copupils, proved an excellent method of dealing with this troublesome condition. In Vienna, there are three schools in which specially trained teachers are dealing with such pupils. It was suggested that among the school physicians appointed by the municipalities, at least one or two should be a fully qualified logopedist. Heretofore this has nowhere been the case.

On the third day, the chief report was by Dr. Hugo Stern on diseases of the voice and their treatment. He produced a tabular summary of all known diseases of the voice, with adequate explanations of the pathology and therapy. The subject of phonesthenia (functional fatigue and weakness of the voice) caused much discussion. He advocated intensive cooperation of physicians and teachers in the treatment of singers' voices. Dr. Brömme explained the famous methods of Engel in developing the voice of speakers and singers. Dr. Demetriades of Athens reported on his experimental researches on the part played by the circulation in the variation of the resonance of the skull. The value of phonetic methods in the investigation of linguistic, historic researches was elucidated by Mrs. E. Richter, while an important paper was presented by Dr. Trojan and Dr. Fröschels on the psychologic and experimental phonetic control in the training of pupils, especially of deaf-mutes and of singers with voice defects. Here the three types of visual, acoustic or motor perception are of utmost importance in influencing the rate of progress of the pupil.

A final demonstration at the clinic of Professor Hajek (for laryngology) was given to the members of the congress. They were invited to visit the phoniatric department, where the director, Docent Dr. Hugo Stern, showed his apparatus for teaching deaf-mutes, stammerers and patients with speech defects after operations on the larynx. A laryngostroboscope gives excellent opportunity to study these conditions and control the progress made by pupils, at the same time aiding them to attain the desired ability in producing voice or words. A number of patients with a newly formed voice after total laryngectomy (using the stomach as a wind reservoir) were shown in whom Stern had thus succeeded in restoring their ability to communicate with their surroundings in a voice that is a little harsh but is otherwise excellent. After a most successful meeting, and a few social entertainments customary at such occasions, it was resolved to arrange another meeting of the newly founded society in two years, and Professor Scripture of London was elected president. With the aid of the vice presidents, Drs. Stern and Fröschels, he will arrange the meeting, to be held in a German city. As the main subject for the coming proceedings, a report on the training of phonetic pupils was selected, and Fröschels and Trojan are to report on it.

Universal Health Control of the Population

In a report to the board of health, Dr. Reiss makes a valuable suggestion, which has already been adopted by some life insurance companies. He advises a regular health examination of that part of the population which is more than 40 years of age, comprising a thorough overhauling of the individual; an examination of his excretions and secretions; roentgenograms; blood cultures, and control of the circulatory system. Exact records are to be kept of each person examined, and any differences appearing should be at once called to his attention. The regular examination is intended chiefly for healthy persons, not for patients already under treatment. By this means, not only would a large number of case histories be collected after a reasonably long time, showing the actual state of health of a large part of the population, but diseases would be discovered at an early stage, with much better prospects of cure or eradication. English life insurance companies offer such regular periodic examinations—which, of course, remain strictly confidential—to their insured members free from charge, because the risks of the company are thus manifestly decreased. The health census would mean an excellent aid in the management of pathologic conditions of mature life and be a certain means of saving a lot of trouble and pains to the individual, at the same time saving a vast amount of public money by combating disease at its primary stage.

BERLIN

(From Our Regular Correspondent)

July 19, 1924.

The Physicians and the Health Insurance Societies

At the recent session of the German medical association in Bremen, the following resolutions and recommendations for the reform of the social insurance system were unanimously adopted:

1. The medical profession is now, as it has been in the past, ever ready to cooperate to the fullest extent in carrying out social insurance legislation. It wishes, however, to emphasize that such cooperation will be of little avail unless the physicians are accorded by such legislation a position and influence that are in keeping with the importance of their work and the execution of their tasks. With this idea in view, independent representative physicians should have a seat and voice in the administrative bodies controlling the affairs of the insured.

2. Since this demand can be met under every form of constitution and with any number of insured members, the questions concerning the federation of the members of health insurance societies or their complete independence of one another have, from the medical standpoint, only subordinate interest. The only essential thing is that the capacity and performance of all insured members shall be fully protected by insurance.

3. In view of the decreased financial capacity of the German people, compulsory insurance of all kinds should be confined to such strata of the population as are sorely in need of insurance protection but are able, through the fruits of their labor, to pay the necessary dues or premiums. Therefore, in connection with health insurance, the following provisions should be established or adhered to: (*a*) Compulsory insurance should be applicable to all persons with an annual income from their labor of less than 2,400 marks. (*b*) The total amount realized from the labor of the insured must form the basis for the estimation of the fees to be paid. (*c*) No persons should be privileged voluntarily to accept insur-

ance in the health insurance societies if their total income is in excess of the limit established for compulsory insurance. (*d*) No form whatever of insurance should be allowed persons with a total annual income of 4,000 marks. (*e*) Questions as to the extension of the insurance privilege to persons of very limited means (small property holders, for example) should not be referable to the federal health insurance administration but should be settled by special measures enacted by the empire, the provinces and the communes.

4. In consideration of the need of furthering and strengthening the health of the people, not only should the performances in kind as at present required be maintained, but in the whole field of government-controlled insurance the cash benefits should be reduced as far as possible and replaced by performances in kind. Annuities of all kinds should be replaced by a wider range of medical treatment, in order that the capacity of the insured may be restored to the highest attainable degree.

5. In the field of health insurance, the benefits and privileges commonly accorded the insured and to which they may legally lay claim are usually adjusted on a very reasonable, commonsense basis. Provided the demands expressed in the third recommendation are complied with, the treatment of members of the family of the insured may be approved and accepted as a benefit to which the insured are regularly entitled.

6. The establishment of the federal health insurance board *(Reichsausschuss)* to adjudicate differences that arise between the physicians and the health insurance societies may be regarded as an attempt to restore ordered relations between the contending parties. The board cannot, however, fulfil its purpose unless the health insurance societies whose members are miners, together with the physicians serving them, are placed under the control of the board.

7. The provisions of the decrees of Oct. 30, 1923, and of Feb. 13, 1924, respectively, which limit the freedom of physicians in the practice of their profession, and likewise the regulations of the federal health insurance board issued at about the same time, were emergency measures which have outlived their usefulness and should, therefore, be abolished at once and as effectively as possible. In place of these decrees, measures should be agreed on looking toward a practicable distribution of physicians throughout the empire.

8. The legal recognition of the right of free choice of physician operates to the best advantage of the insured, the physicians, the employers and the whole German people.

9. In order that all physicians may be in the possession of the needed information pertaining to social insurance legislation and service, obligatory lectures on the subject should be organized in all the medical schools of the country.

Regulations Pertaining to the Duties of Nurses

The federal health insurance board *(Reichsausschuss)* has established the following rules and regulations as governing the activities of nurses serving health insurance societies in the rural districts:

1. Only nurses holding state diplomas will be recognized.

2. The duties of nurses employed by the health insurance societies as care-taking personnel or as assistants to physicians shall be confined, in the treatment of patients, to the actual care of the sick or to the performance of such work as is necessitated by the ministrations carried out or prescribed by physicians.

3. If a nurse is called by a patient or by some member of the family, she should call the patient's attention to the desirability of summoning a physician. In urgent cases it is her duty to call a physician herself, or at least see to it that one is called.

4. Nurses are forbidden: (*a*) to give independent advice as to how the patient should be treated; (*b*) to render independent aid, except first aid in emergencies, and then only until the arrival of the physician, and (*c*) to endeavor to influence patients in favor of or in opposition to certain physicians.

5. If a physician thinks a nurse should be called to care for a patient, he must see to it that the health insurance society is so informed.

6. Nurses must, in the treatment of patients, faithfully follow the directions of the physician.

7. Complaints of physicians on account of infractions of Rules 1 to 4 on the part of nurses and complaints of nurses against physicians will be heard and acted on by the council of physicians associated with each health insurance society. As far as possible, representatives of the nurses' organizations more particularly concerned should be present at the deliberations of the council and should be allowed to present their side of the case.

Marriages

JOHN KENNETH VON LACKUM, Cedar Rapids, Iowa, to Miss Adellia Boies of Des Moines, Iowa, at Waterloo, April 21.

DONNAN BEUTER HARDING, Iowa City, Iowa, to Miss Margery Herberling of Tiffin, Iowa, June 24.

FAYETTE CLAY EWING, Alexandria, La., to Miss Rowena Annette Clark, Princeton, Ill., August 2.

W. CARLETON WARRICK, Detroit, to Miss Ann Martin, Orleans, Mass., at Detroit, July 10.

CLEMENT A. JARKA, Mount Carmel, Pa., to Miss Helen V. Pietrowski, Astoria, N. Y., July 8.

JOSEPH G. WALKER, Lyons, Kan., to Miss Edna Ruby Barnes, Hazelton, Kan., August 4.

JESSE J. HOLES, Battle Creek, Mich., to Miss Jessie M. Gibbons, Watseka, Ill., June 9.

ALPHONSE R. DES JARDINES, Lincoln, Neb., to Miss Bertha S. Baer, Eustice, Neb., July 12.

ALTRUS B. HARVEY, Tylertown, Miss., to Miss Myrna Clark, Mount Olive, Miss., August 4.

A. FILLMORE COMPTON to Miss Evangeline Henderson, both of Moundsville, Va., recently.

ROSEWELL C. BASSINGER, Mobile, Ala., to Miss Helen Bolinger, Bolinger, Ala., July 17.

JOHN HIGGINS CURTIN to Miss Loretta Marie Saunders, both of Flint, Mich., July 28.

RODNEY P. FAGAN to Miss Mary Elizabeth Allen, both of Des Moines, Iowa, May 20.

ROBERT E. CUMMINGS, Delavan, Wis., to Miss Gladys Meehan, Chicago, July 2.

HALBERT R. HILL, Auxvasse, Mo., to Miss Verta L. Driscoll of Mexico, Mo., June 17.

A. MARTIN SWANSON, Rockford, Ill., to Miss Alice Bowman, Guilford, Ill., June 25.

EDGAR R. EARWOOD to Miss Helen Hart, both of Fort Dodge, Iowa, recently.

OSMON C. CHURCH, Quincy, Ill., to Mrs. Mary Easterly, Ullin, Ill., July, 1924.

ERLING W. HANSON to Miss Anne Ruth Eddy, both of Minneapolis, June 4.

FRANK J. CHMELIK, Joliet, Ill., to Miss Georgiana Vonasek of Chicago, July 7.

JAMES W. JONES to Miss Frederica Loomis, both of San Francisco, recently.

CARL T. ROSE, New York, to Miss Lillian Goldenberg, Los Angeles, July 30.

GEORGE L. CLARKE, Lincoln, Neb., to MILDRED L. JOHNSON, Omaha, June 5.

LLOYD LACEY to Miss Dorothy Care, both of Des Moines, Iowa, April 19.

MORITZ GROSS to Miss Florence Maunel, both of New York, August 2.

ANNE AGASSIZ to Gordon Chickering Prince, both of Boston, May 31.

Deaths

Bertram Welton Sippy ✠ well known for his work on diseases of the stomach and gastro-intestinal tract and as a clinical teacher of marked ability, died suddenly of heart disease, complicating diabetes, at his summer home near Ludington, Mich., August 15. Dr. Sippy was born in Neptune, Wis., Oct. 30, 1866. He attended the University of Wisconsin, 1884-1887, and then went to Rush Medical College, where he received his medical degree in 1890. He served for two years as an intern in the Cook County Hospital, and then was for three years assistant chief surgeon of the Northern Pacific Railroad. In 1895, he went to Vienna for one year of post-graduate study, and on his return became instructor, and later assistant professor of medicine in Rush Medical College. Since 1906, he has been professor of medicine in Rush Medical College and the University of Chicago. He was a member of the Association of American Physicians and the American Gastro-Enterological Association, and attending physician at the Presbyterian Hospital and other Chicago institutions. Dr. Sippy was especially well known for his system of treatment of gastric and duodenal ulcers, a method elaborated on the basis of physiologic and chemical studies. He contributed special articles on this condition to periodical literature and to such works as the Oxford and Nelson Systems of Medicine. He was an indefatigable worker, attending a large clientele and giving instruction to numerous students, assistants and practitioners. During recent years he had devoted much attention also to the care of his country estate near Ludington.

George Arthur Piersol ✠ Philadelphia; professor emeritus of anatomy University of Pennsylvania School of Medicine, Philadelphia; died at his home, August 7, aged 68, following a long illness. Dr. Piersol graduated from the Department of Medicine, University of Pennsylvania, Philadelphia, 1877, and until 1882 was assistant demonstrator of histology in his alma mater. He became demonstrator of embryology later and in 1891 professor of anatomy, which position he held until retired in 1921 on account of poor health. He was president, 1910-1911, of the Association of American Anatomists and for fourteen years a member of the board of editors of the *American Journal of Anatomy*. He was a member of the Philadelphia Pathological Society, the Academy of Natural Sciences and a fellow of the College of Physicians of Philadelphia, the author of "Normal Histology," "Human Anatomy" and a translation of Verligger's "Brain and Spinal Cord," on a revision of which he was working at the time of his last illness.

Samuel Johnson Walker ✠ Chicago, died in Lake Forest, August 19, aged 57 years, of cerebral hemorrhage. He was graduated from Yale in 1888, and studied medicine in Northwestern University Medical School, from which he received his degree in 1894; then followed two years of postgraduate study in Europe. He was adjunct professor of diseases of children in the College of Physicians and Surgeons, Chicago, from 1900 to 1903, and president of the Chicago Pediatric Society, 1904-1905. He served also as attending physician to the Passavant Memorial Hospital, St. Vincent's Infant Asylum and the Children's Memorial Hospital. During the World War he was sent by the Red Cross for ten months' service in the mountainous region of Macedonia and Greece, giving special attention to the care of typhus. For this work, he received a special decoration from the king of Greece.

Benjamin Farquhar Curtis, Hastings-upon-Hudson, N. Y.; Medical Department of Columbia College, New York, 1881; member of the Medical Society of the State of New York; professor of principles of surgery and clinical surgery, University and Bellevue Medical College, New York; on the staffs of the St. Luke's Hospital and Bellevue Hospital; consulting surgeon to the General Memorial Hospital; New York Orthopedic Hospital and Dispensary, and the Manhattan Eye, Ear and Throat Hospital; a member of the American Surgical Association and the New York Academy of Medicine; died, August 5; aged 67.

Richard Fitz Harris Gundry ✠ Catonsville, Md.; College of Physicians and Surgeons, Baltimore, 1888; formerly assistant physician at the state hospitals at Dayton and Athens, Ohio; established the Richard Gundry Home, Catonsville, 1891; formerly president of the Baltimore County Medical Association; member of the board of directors of the Spring Grove Hospital; member of the American Psychiatric Association; died at his home, August 5, aged 58, following an operation in June for nephrectomy.

Ernest Marsters Vaughan, Brooklyn; Cornell University Medical College, New York, 1906; member of the Medical Society of the State of New York; associate professor of pathology, Long Island College Hospital, Brooklyn; formerly conducted a sanatorium in Brooklyn; assistant to the district attorney for Kings County; served in France during the World War; died, August 4, aged 45, at the Brooklyn Hospital following an operation for ulcer of the stomach.

Henry Moeller ✠ New York; Medical Department of Columbia University, New York, 1871; member of the Academy of Medicine, the New York Pathological Society and the Medical Society of Greater New York; formerly on the staff of the Hospital for Ruptured and Crippled Children; a practitioner in New York City for more than fifty years; died, August 5, at his home; aged 81.

Herbert Fiske Bishop, Alhambra, Calif.; Hahnemann Medical College and Hospital of Philadelphia, 1900; on the staff of the Alhambra Hospital; member of the executive board of the Alhambra branch of the Pacific-Southwest Bank; aged 52, was drowned, July 22, off Santa Cruz Island, when the boat in which he was sailing capsized.

William Hodgson Glynn, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1902; a member of the Medical Society of the State of Pennsylvania; on the staffs of the St. Roselia Foundling Asylum and of St. Joseph's Hospital; served in France during the World War; died, July 31; aged 46.

John Smith Hartford ✠ Oklahoma City; Kansas City Medical College, Kansas City, Mo., 1901; associate professor of gynecology, University of Oklahoma School of Medicine; on the staff of the St. Anthony's Hospital, where he died, July 28, aged 50, of cerebral hemorrhage.

Frederick Harris Bailey, Fargo, N. D.; University of Buffalo (N. Y.) Department of Medicine, 1893; member of the North Dakota State Medical Association; specialized in ophthalmology, otology, laryngology and rhinology; aged 57; died, July 28.

Thomas Irwin Padgett, Terre Haute, Ind.; Hospital College of Medicine, Medical Department of Central University of Kentucky, Louisville, 1889; formerly coroner of Greene County; served in the World War; died, August 5, aged 60.

Charles Henry Blake, Newark, Del.; Baltimore University School of Medicine, Baltimore, 1902; member of the Delaware State Medical Society; president of the board of health of Newark; died, July 29, aged 48, of cerebral hemorrhage.

John Hester Ward ✠ Tuscaloosa, Ala.; University of the South, Medical Department (Sewanee Medical College), Sewanee, Tenn., 1899; aged 47, was found dead, August 4, in his office of a bullet wound, presumably self-inflicted.

Andrew R. Robertdeau Holderby, Collegepark, Ga.; Atlanta Medical College, Atlanta, Ga., 1858; also a minister; Civil War veteran; one of the founders of the Presbyterian Hospital, Atlanta; died, August 3; aged 85.

Albert F. Sheibley, Ottawa, Ohio; Starling Medical College, Columbus, Ohio, 1895; member of the Ohio State Medical Association; for many years county coroner; died, August 3, aged 59, following a long illness.

Ralph Ross Jordan, Du Bois, Pa.; Department of Medicine, University of Pennsylvania, Philadelphia, 1903; member of the Medical Society of the State of Pennsylvania; died, July 31, aged 51, of nephritis.

Henry M. Argabright, Clare, Va.; College of Physicians and Surgeons, Baltimore, 1879; died, June 17, aged 68, at the Kings Daughters Hospital, Staunton, Va., of diabetes mellitus and myocarditis.

Frederick Stocker Raddin, Chelsea, Mass.; Medical School of Harvard University, Boston, 1891; formerly on the staff of the Frost Hospital, now the Chelsea Memorial Hospital; died, July 28; aged 58.

Thomas Garland Turk, Reynolds, Ga.; Atlanta School of Medicine, Atlanta, Ga., 1908; member of the Medical Association of Georgia; died, July 25, at his home, of heart disease, aged 50.

Sherman T. Dodge, Corpus Christi, Texas; American Medical College, St. Louis, 1905; member of the State Medical Association of Texas; died, July 23, aged 59, of cerebral hemorrhage.

George D. Carnes ✠ South Haven, Mich.; Detroit Medical College, Detroit, 1876; formerly president of Kalamazoo Academy of Medicine; died, August 1, aged 73, following a long illness.

Phillip Cooper ⊕ Syracuse, N. Y.; Syracuse University College of Medicine, Syracuse, N. Y., 1912; died, August 5, aged 35, at the Hospital of the Good Shepherd following an operation.

Frank Spencer Halsey, New York; New York University Medical College, 1885; member of Medical Society of the State of New York; died suddenly, August 2, aged 63, of heart disease.

Jacob Gyore Green, Malden, Mass.; University of Budapest, Hungary, 1884; vice president of the Malden Anti-Tuberculosis Society; died, August 7, aged 63, following a long illness.

Alonzo B. Capel ⊕ Shawneetown, Ill.; Marion-Sims-Beaumont Medical College, St. Louis, 1902; died, August 4, aged 56, as the result of injuries received in an automobile accident.

Charles E. Harnsberger, Alhambra, Ill.; Missouri Medical College, St. Louis, 1880; aged 60, was killed, August 4, when the automobile in which he was driving was struck by a train.

Thomas Benton Hill, Waynesburg, Pa.; Jefferson Medical College of Philadelphia, 1875; member of the Medical Society of the State of Pennsylvania; died, July 25; aged 80.

Jacob Milton Hopkins, Alexandria, Va.; Howard University School of Medicine, Washington, D. C., 1894; died suddenly, aged 51, while attending a patient, July 26.

George T. Finch, Thompsonville, Conn.; Bellevue Hospital Medical College, New York, 1877; member of the Connecticut State Medical Society; died, July 29; aged 70.

C. E. Shackelford, Dallas, Texas; Memphis Hospital Medical College, Memphis, Tenn., 1905; died, July 29, aged 45, from the effects of poison taken accidentally.

Joseph E. Piché, Rexton, Mich.; Montreal School of Medicine and Surgery, Montreal, Canada, 1889; was found dead in bed of heart disease, July 26, aged 62.

Edward Palmer LeCompte, Park City, Utah; Missouri Medical College, St. Louis, 1875, aged 75; was found dead in his office of cerebral hemorrhage, July 26.

Frank C. Genung, Wausa, Neb.; College of Physicians and Surgeons, Chicago, 1891; served in the World War; died, July 27, aged 58, of heart disease.

William M. Hardin, Evansville, Ind.; Medical Department University of Louisville, Louisville, Ky., 1893; died, July 31, aged 59, following a long illness.

William T. Porch, Waverly, Tenn.; University of Nashville Medical Department, Nashville, Tenn., 1869; Confederate veteran; died, July 28, aged 89.

Oscar F. Searl, Solomon, Kan.; Berkshire Medical College, Pittsfield, Mass., 1865; Civil War veteran; died, July 19, aged 82, of cerebral thrombosis.

Joseph Klapp, Philadelphia; Jefferson Medical College of Philadelphia, 1889; died at his summer home in Ocean City, N. J., July 31, aged 74.

Richard J. Bickerdike, Chicago; National Medical College, Chicago, 1898; died in Los Angeles, August 10, aged 64, following a long illness.

Robert Lee Jones, Rayville, La.; Louisville Medical College, Louisville, Ky., 1897; aged 55; died at his home, July 16, of cerebral hemorrhage.

John H. Urquhart, Ironwood, Mich.; Rush Medical College, Chicago, 1895; died at Miami, Fla., July 23, aged 61, following a long illness.

Edward H. Wilsey, Chesapeake City, Md.; Hering Medical College, Chicago, 1894; died, July 30, aged 59, following a long illness.

Absalom H. Wingo, Norcross, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, Ga., 1886; died, July 30; aged 68.

Wilson L. Peters, Circleville, Ohio; New York Homeopathic Medical College and Hospital, 1897; died, July 28; aged 73.

Robert A. Anderson, Gulfport, Miss.; Memphis (Tenn.) Hospital Medical College, 1898; died, August 1; aged 51.

Edward William Perry, Providence, R. I.; Dartmouth Medical School, Hanover, N. H., 1877; died, August 6.

Edward S. Coyle, Schenectady, N. Y.; Albany Medical College, Albany, N. Y., 1882; died, August 7, aged 68.

David M. Castle, Philadelphia; Hahnemann Medical College of Philadelphia, 1873; died, August 6; aged 81.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

MORE MISBRANDED NOSTRUMS

Abstracts of Recent Notices of Judgment Issued by the Bureau of Chemistry of the United States Department of Agriculture

Doan's Kidney Pills.—The Foster-Milburn Co., Buffalo, N. Y., manufacturers of "Doan's Kidney Pills," shipped in October and November, 1923, a quantity of this nostrum that was misbranded. Analysis of a sample of the article by the Bureau of Chemistry showed that the pills consisted essentially of potassium nitrate, ground leaves of uva ursi (bearberry), a trace of volatile oil such as turpentine or juniper oil, a resin, starch, sugar and talc. Some of the claims made on the trade package for these pills were:

"Kidney Pills acting directly on the Urinary System."

"There are certain trades in which those following such trades are subect to kidney troubles. In such cases, if these pills are indicated, increase the dose. When relief is noticed, the dose may be reduced."

"If you perform indoor work or any kind of work which strains the kidneys, increase the dose."

Typical "scare stuff" advertising of Doan's Kidney Pills. Frightening the public into the belief that lumbar soreness means kidney disease.

The government officials declared that the curative claims made for Doan's Kidney Pills were false and fraudulent and on January 30, 1924, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 12113; issued July, 1924.*]

The advertising of "Doan's Kidney Pills" has long been an offense against the public health. For years the advertising methods of this concern have been such as to frighten the public into the belief that pain or soreness in the lumbar region is indicative of kidney disease. The manufacturers of Doan's Kidney Pills or some of their officers for years seem to have been members of the Proprietary Association, the "patent medicine" organization, which professes to accept for membership only those who will market their products in such a way as not to violate the law. As the association has for years kept its general membership secret, it is impossible to tell how many of the "patent medicine" fakers who have been found guilty of fraudulent practices belong to that organization. The favorite method by which the manufacturers of "Doan's Kidney Pills" advertise is that of publishing testimonials in country newspapers, the testimonials in question having been given by those living in the locality in which the paper is published. THE JOURNAL has at various times shown that these advertisements are occasionally boomerangs. There was the case, for instance, of Mr. Ford of Kankakee whose testimonial appeared in a Kankakee paper three months after the poor man was dead and buried. There was the testimonial of Mrs. Butcher of Guthrie, Okla., whose testimonial for this "kidney cure" appeared in the home paper two months after she had died of nephritis. Nettie Woodrow's testimonial appeared in the same issue of a Glenwood (Iowa) paper that carried Mrs. Woodrow's death notice, while the death notice of Mr. Moon of Nashua, Iowa,

appeared in the same issue of the *Nashua Reporter* that carried that gentleman's testimonial. The "Doan's Kidney Pills" concern apparently makes an effort to prevent such unfortunate occurrences as those just cited. They claim to instruct the papers that carry their advertising to check up on the local testimonial givers and, if the individuals are found to be dead, to return the advertising copy for revision! There is no moral or economic excuse for the sale of home remedies that are recommended for the treatment of so serious a condition as kidney disease. Every "patent medicine" sold for this purpose is potentially dangerous and inherently vicious.

Lafayette Headache Powders.—The Lafayette Co., Berlin, N. H., shipped between October, 1922, and September, 1923, a quantity of Lafayette Headache Powders that were misbranded. The Bureau of Chemistry analyzed this nostrum and reported that the headache powders consisted essentially of acetanilid, caffein, sodium bicarbonate and aromatics, including cinnamon and ginger. The trade package bore such claims as:

"Relieves Nervous and Bilious Headaches, Neuralgia, Sleeplessness, Cold with Fever, La Grippe, Mental Exhaustion and Sour Stomach."

"Allay all pains in the Head; all kinds of Neuralgia Heaviness of the Head, Nonchalance, Apathy resulting from intellectual Overwork, from Loss of Sleep or from a Bad Digestion . . . effectively alleviate Grippe accompanied or not with Fever."

These claims were declared false and fraudulent and in February, 1924, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed. —[*Notice of Judgment No. 12104; issued July, 1924.*]

Grogan Mineral Water.—Arthur W. Canfil who did business at Sweetwater, Texas, under the trade name Grogan Wells & Boone Institute of Massage, shipped in October, 1919, a quantity of "Grogan Mineral Water" that was adulterated and misbranded. Adulteration was charged because examination by the Bureau of Chemistry of specimens of Grogan Mineral Water showed the presence of large numbers of bacteria and gas-forming organisms indicating that the water was polluted with filthy animal and vegetable substances. The product was declared misbranded because it was falsely and fraudulently represented to be an effective "cure for rheumatism, gastro-intestinal and all liver and kidney trouble, when, in truth and in fact, it was not." In October, 1923, Arthur W. Canfil pleaded guilty and was fined $50.—[*Notice of Judgment No. 12189; issued July, 1924.*]

Correspondence

TREATMENT OF DIPHTHERIA CARRIERS WITH GENTIAN VIOLET

To the Editor:—I have read with interest Dr. Saurman's article on this subject (The Journal, July 26). The following case illustrates the possibility of erroneous conclusions being drawn from negative cultures following the use of this dye:

The possibility of gentian violet proving efficacious in the treatment of diphtheria carriers occurred to me following the appearance of Churchman's paper on "Selective Bacteriostasis in the Treatment of Infections with Gentian Violet" (The Journal, Jan. 17, 1920), and a suitable case for experiment was found in a young woman who had passed through an attack of diphtheria late in November, 1919, and had given positive cultures up to Jan. 31, 1920. A cotton swab saturated with a saturated aqueous solution of gentian violet was pressed against the back of the pharynx, the dye spreading to the tonsils and pharyngeal wall. The attending physician, contrary to instructions, used the solution first, February 2, and after a twenty minute interval used it again. After waiting half an hour, he took a culture which, as might be expected, was found negative. The patient herself used the solution night and morning, February 3 and 4, and on February 6 the attending physician repeated his procedure of February 2. The culture again proved negative. The patient used the dye herself at intervals and on February 21—three days after she had discontinued all treatment—I took a culture myself, which proved negative, and the patient was instructed to use no further treatment. A culture taken on February 28 was negative, but a fifth culture, taken March 3, proved to be positive.

The attention of the district state health officers of the New York State Department of Health had been called to the possibility of this form of treatment, and it was tried in a number of instances, without striking success, when cultures were taken a week or more after discontinuing treatment.

Apparently, while it is possible to obtain negative cultures for several days following the use of the dye, it cannot be relied on to eliminate diphtheria organisms from diseased tonsils. It seems probable that the dye merely destroys the diphtheria bacilli to the depth to which the dye penetrates, and that growth in the superficial layers of the mucous membrane is inhibited only as long as the dye remains in the tissues.

Edward S. Godfrey, Jr., M.D., Albany, N. Y.
Director, Division of Communicable Diseases,
State of New York Department of Health.

TREATMENT OF HYPEREMESIS GRAVIDARUM

To the Editor:—Referring to Dr. Udaeta's treatment of vomiting in pregnancy (Madrid Letter, The Journal, March 15, p. 922), through mere chance I stumbled on the conclusion that by transfusing blood from the husband to the pregnant wife, it is possible to control within twenty-four hours the most rebellious vomiting of pregnancy. I have tried this successfully in three cases. I have also two other cases, but in these the transfusion was not made by the vein-to-vein method, but merely by taking 4 c.c. of the donor's blood and, after mixing it with 1 c.c. of 1 per cent. sodium citrate solution, injecting it into the recipient. This was repeated twice. The vomiting also stopped forty-eight hours after the first injection. I should not have dared to report this small number of cases had I not read in The Journal of Dr. Udaeta's theory of vomiting in pregnancy.

F. Baltodano C., M.D., San Juan de Limay, Nicaragua.

"CURRENT CRITICISMS OF MEDICAL EDUCATION"

To the Editor:—I have read with much interest the communication of Dr. William Allen Pusey concerning criticism of medical education (The Journal, August 9). I hope this matter will be threshed out until there is a clear understanding of a real and very serious situation. One of the best men among Chicago medical teachers said all this to me, and more, within the last year. Apparently each school is so afraid that its prestige might be damaged that it follows without protest along the path of education which has been laid out for it in the last fifteen or twenty years and which, to say the least, is leading into a bad situation. I have been in active general practice twenty-eight years, fifteen of them in a town of 10,000 where we had no hospital for eight years, and the last thirteen in a well equipped college community of 35,000. I think, therefore, that I have had a fair opportunity for observation of what is happening in the supply of physicians in the best agricultural part of the Mississippi Valley. I know now constantly a lot of students. It is not the rich boy who is necessarily the best prospect in any course of study. The one we all want is the one who has determination

enough and persistence enough to tackle a course when he cannot see his way clear to go through with it. A young man of good judgment, courage and persistence, who has an accredited high school diploma, perhaps a few hundred dollars, no family to help him, plenty of grit and nothing else, will do some hard thinking before he decides on a medical course today. We are making a lot of engineers and chemists and business men who ought to be doctors and good ones at that, but who are not going into medicine because they are intelligent enough to reckon the cost and the difficulties of a preparation for our profession.

Let me add that I am in no way dissatisfied with my own lot, either past or present, and that I had an academic degree before beginning the study of medicine, as Dr. Pusey had; but I, nevertheless, am in full accord with the position taken in his address to the House of Delegates.

CLEAVES BENNETT, M.D., Champaign, Ill.

THE DISPENSING OF GLASSES

To the Editor:—When a man has been fifty years in practice (as I have been), he must depend on the printed page for the bulk of his medical news. That accounts for my having but recently learned (THE JOURNAL, July 26) that the Section on Ophthalmology passed a resolution deprecating the dispensing of glasses by medical men. May I venture the prediction that in practical results it will be disappointing. Perish the thought that any self-respecting ophthalmologist will persist in any practice that would render it increasingly difficult for the public to distinguish him from the optometrist; but such a man cannot waste his time in dodging imitators, and, in the dispensing of glasses, he was there first. He may even prefer to delegate this part of his work; but he can hardly refuse the practical demand of many patients that the work be done in this way (they trusting, and rightfully, that he will protect them from excessive cost), or ignore the real need of his inspection of the job, in situ, before delivery. As a matter of fact, this final inspection is the crux of the situation. After almost forty-five years of doing my work in this undignified (?) way (for the first forty-three years unavoidably by mail order from standard houses, and, for the remainder, from a branch of one of them on the next street), and despite any charge that I may be wedded to my idols, I still see no better way ahead. The irreducible minimum of shop mistakes is still sufficiently large to make all sorts of trouble; and if some of my city confrères, who seem committed to the extraprofessional practice, could see me (as they might at odd times) correct the part they had too trustingly left to the optician, they might be more of my opinion. In conclusion, I must protest against the manifest interpretation of the resolution. So far I have seen no account of the Section on Practice of Medicine deprecating the dispensing of medicine by the general practitioner.

H. B. YOUNG, M.D., Burlington, Iowa.

[NOTE.—The resolution referred to was taken by the Section on Ophthalmology but was not referred to the House of Delegates. It does not therefore constitute an action of the American Medical Association.—ED.]

Cerebrospinal Meningitis Epidemic in Nigeria.—A considerable outbreak of cerebrospinal meningitis occurred in northern Nigeria, where 282 cases and 192 deaths were reported in February as against 124 cases and 64 deaths in January. Only a few cases were reported in Uganda, where serious epidemics had occurred in 1922 and 1923. It is pointed out that epidemics of this disease have become frequent in the northern tropical prairie belt of Africa during recent years. In the other parts of the world, however, cerebrospinal meningitis is stated to be less prevalent so far in 1924 than in 1923.—*Pub. Health Rep.* **39**: 1574 (June 27) 1924.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

CAUSES OF KIDNEY CALCULI

To the Editor:—Although I have been a subscriber to THE JOURNAL for twenty-five consecutive years, I do not remember to have ever troubled you with a query. Again, although I am approaching my seventy-ninth birthday, I have never seen a similar case to the one in whose interest I now earnestly make this inquiry. What is the latest accepted theory as to the cause of the formation of renal calculi? And, more pertinent still, what should be done to prevent their further recurrence? Three years ago I had this patient—a woman of 45, who leads a model life—exposed to the roentgen ray and found two large stones in one kidney and one in the other. These were successfully removed at the proper interval between operations. Today she is having another large stone removed from the right kidney. Evidently this has formed within three years, and naturally the patient is greatly exercised to know how to prevent a return. Any aid that you can render will be greatly appreciated.

M.D., Ala.

ANSWER.—The most generally accepted theory as to the cause of kidney calculi is that of infection. Paul says, "If every case of nephrolithiasis could be investigated with sufficient thoroughness, a history of a preceding systemic infection could be elicited"; also that the removal of a calculus from the upper urinary tract should be considered only an important preliminary step in the cure and that treatment of the concurrent infection must be thoruoghly carried out if recurrence is to be avoided. C. H. Mayo regards the infection theory as the only tenable one. Sir Almroth Wright of London suggests that a search for a bacterial cause be made in every case of urinary calculus. Chetwood regards the cause as depending on whether the stone forms in a kidney in which there is no morbid process (primary calculus) or in a kidney in which there is some preexisting pathologic condition (secondary calculus), such as pyelitis. He says that urate, oxalate and cystin stones are nearly always primary, being formed in aseptic kidneys on account of causes most of which are not essentially renal. Phosphate and carbonate stones are usually deposited in connection with infection. There are various influences that probably play a part in the production of kidney stones; these are diet, diminution of fluid intake, excessive drinking of acid wines, excess of nitrogenous food, disturbances of metabolism, and hereditary disposition. Weintraub believes that certain drugs are also contraindicated in renal colic due to precipitation of uric acid, such as cinchophen (unless accompanied by large doses of sodium bicarbonate). The diet should be free from substances that are rich in purins or highly acid. Nothwithstanding unwarranted claims to the contrary, there is no remedy that will dissolve calculi. Chetwood says that piperazin taken with copious drafts of mineral water in doses of from 0.5 to 1 gm. three times a day will help keep in solution uric acid salts, and with very small stones may dissolve the surface to some extent so as to aid in their dislodgment and passage; but the mechanical influence of the free diuresis caused by copious drafts of water may fulfil the same requirements. On the other hand, the Council on Pharmacy and Chemistry omitted Piperazine from New and Nonofficial Remedies in 1918 for the reason that it had been sufficiently tried to justify the conclusion that it was not of value as a uric acid solvent.

EXAMINATION OF INFANT'S EYES

To the Editor:—I am wondering as to the possibilities of diagnosing a condition in which a child, aged 2 months, shows exophthalmos or at least a very marked showing of "the whites of the eyes," and seems to look down, although it can look up.

P. W. VAN METER, M.D., Rockwell City, Iowa.

ANSWER.—It is, of course, difficult to diagnose any ocular condition in a child so young that it cannot respond to the simple requests of the oculist. However, pure objective examination can frequently yield the key to the puzzle, and such examination should consist in a careful study of the pupillary reflexes and an analysis of any pathologic changes that may be found in the fundus. The cooperation necessary for examination of the ocular muscles or the visual fields is naturally out of the question.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALASKA: Juneau, Sept. 2. Sec., Dr. Harry C. DeVighne, Juneau.
IOWA: Des Moines, Oct. 1-3. Sec., Dr. Rodney P. Fagen, Capitol Bldg., Des Moines.
MASSACHUSETTS: Boston, Sept. 9-11. Sec., Dr. Charles E. Prior, 144 State House, Boston.
NEW HAMPSHIRE: Concord, Sept. 11-12. Sec., Dr. Charles Duncan, Concord.
PORTO RICO: San Juan, Sept. 2. Sec., Dr. D. Biascoechea, San Juan.
RHODE ISLAND: Providence, Oct. 2-3. Sec., Dr. B. U. Richards, State House, Providence.

MEDICAL STATISTICS OF HOSPITALS

Retrospect and Prospect

E. H. LEWINSKI-CORWIN, PH.D.
AND
A. ELEANORE CONOVER, M.D.
Director and Assistant Director, Respectively, Hospital Information Bureau
NEW YORK

Statistics have been proverbially abused. The disparagement of statistics by the man on the street has a twofold basis: first, the data from which some statistical tables are made up are either too fragmentary or inadequately gathered, and, second, the person handling the array of figures frequently does not possess the necessary training or sufficient common sense to interpret these correctly, or, as is often the case, has a definite aim in view and does not hesitate to manipulate the tabulation to prove the point.

Through the efforts of Karl Pearson and others, the science of statistics has gained in precision and applicability, and it will not be long until jokes about statistics will lose their present currency and appeal.

Medical statistics constitute one of the most neglected fields with regard to the application of scientific method, and comparatively few medical men have any conception of the wealth of information that they are capable of yielding if properly compiled and analyzed. One reason that medical statistics, aside from mortality statistics, have not been scientifically utilized is that they have never been handled in large masses. Only when large numbers are involved can the most solid deductions be obtained and the chances of error be reduced to a minimum. Heretofore, the great bulk of deductions pertaining to medical and surgical procedures and results have been based on individual observations, which are of necessity limited, or on "personal experience," which is not a safe guide. It is only recently that an effort has been made toward precision of recording in hospitals, and large bodies of facts are becoming available for statistical analysis.

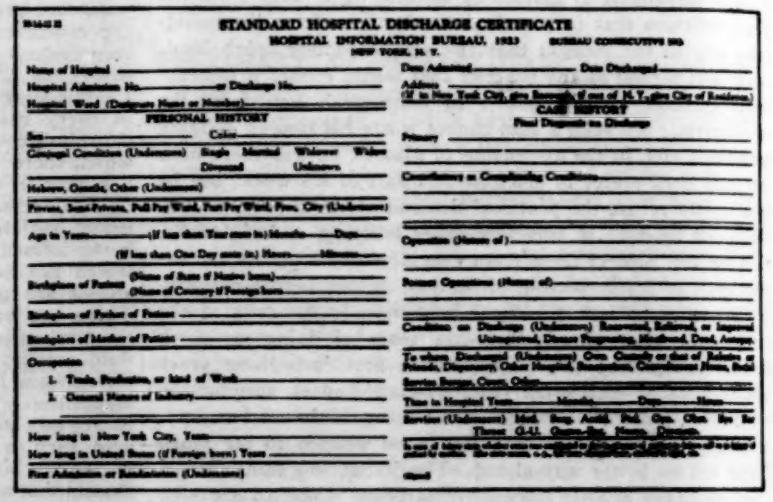
In his analysis of "Mortality and End-Results in Surgery," Dr. William J. Mayo[1] demonstrated the value of statistical analysis based on large numbers, saying: "In order to secure a perspective which will not be distorted by the minutiae, the mass rather than the details should be considered." One of the most important deductions of this study of 10,280 operations performed in St. Mary's Hospital, Rochester, Minn., in 1919, was that "some deaths and many poor end-results, apparently due to accidental or unpreventable causes, occur with a regularity so definite that their incidence can be foretold from year to year," and to this Dr. Mayo added the significant statement, "That which can be foretold can be prevented."

1. Mayo, W. J.: Surg., Gynec. & Obst. 32:97 (Feb.) 1921.

If there is no other reason for statistical analysis, the fact that untoward consequences can be foretold, and therefore a clue to prevention found, is sufficient justification for undertakings of this character.

A great deal has been written on the desirability of a scientific presentation of hospital experience and the value of comparative results of a large number of hospitals. Frederick L. Hoffman[2] has prepared a monograph on some of the fundamental facts that can be obtained from hospital statistics, which was based on the experience of the Johns Hopkins Hospital from 1892 to 1911. Dr. Harvey Cushing,[3] in his annual summaries of the experience of the surgical department of the Peter Bent Brigham Hospital, Boston, points out the value of comparison with other hospitals. In one of these reports he says:

"Figures such as those which are given in the foregoing table, however, lose their chief interest and value unless they can be utilized as a means of comparison with the year's work of other teaching hospitals. All who deal with such statistics fully realize that they can be made to show almost anything that one desires, and unless there is some agreement between hospitals as to common standards of tabulation they can be very misleading. . . . Not until the clinical chiefs of our major hospitals come to share with the administrator an interest in these annual reports may we expect to have any uniformity in the methods of reviewing from year to year the results of our therapeutic efforts in the operating room and at the bedside. Without uniformity, any comparison of these results is impossible, though it was for these ends that the hospitals were really established."



STANDARD HOSPITAL DISCHARGE CERTIFICATE
HOSPITAL INFORMATION BUREAU, 1923
NEW YORK, N. Y.

Name of Hospital
Hospital Admission No. or Discharge No.
Hospital Ward (Designate Name or Number)
PERSONAL HISTORY
Sex Color
Conjugal Condition (Underscore) Single Married Widower Widow Divorced Unknown
Hebrew, Gentile, Other (Underscore)
Private, Semi-Private, Pull Pay Ward, Part Pay Ward, Free, City (Underscore)
Age in Years (If less than One Year state in) Months Days
(If less than One Day state in) Hours Minutes
Birthplace of Patient (Name of State if Native born) (Name of Country if Foreign born)
Birthplace of Father of Patient
Birthplace of Mother of Patient
Occupation
1. Trade, Profession, or kind of Work
2. General Nature of Industry
How long in New York City, Years
How long in United States (if Foreign born) Years
First Admission or Readmission (Underscore)

Date Admitted Date Discharged
Address
(If in New York City, give Borough. If out of N. Y., give City of Residence)
CASE HISTORY
Final Diagnosis on Discharge
Primary
Concurrent or Complicating Conditions
Operation (Nature of)
Minor Operations (Nature of)
Condition on Discharge (Underscore) Recovered, Relieved, or Improved Unimproved, Disease Progressing, Moribund, Dead, Autopsy
To whom Discharged (Underscore) Own Custody or that of Relative or Friends, Dispensary, Other Hospital, Reformatory, Charitable Home, Bail
Service Branch, Corps, Other
Time in Hospital Years Months Days Hours
Service (Underscore) Med. Surg. Acute, Ped. Gyn. Obst. Eye Ear Throat G.U. Orthopedic Neuro. Dermatol.

Fig. 1.—Uniform certificate for information concerning discharged patients.

Pearl has described in detail the technic of procedure for the assembling and presentation of medical statistics of hospitals. He has emphasized the opportunities for contributions of properly prepared and interpreted hospital statistics, and states that heretofore the number of such contributions has been very meager.

The annual reports of hospitals are peculiarly uninteresting documents, and very few of them contain the statistics of the medical experience of the hospital. These, when presented, are often not comparable with those of other institutions because of a different system of nomenclature and presentation. It is a question whether the general annual report should publish such detailed statistics. The answer to it turns on the question, For whom are these reports intended? When this question is definitely settled, the

2. Hoffman, F. L.: Statistical Experience Data of the Johns Hopkins Hospital, Baltimore, Johns Hopkins Press, 1913.
3. Peter Bent Brigham Hospital, Ninth Annual Report for the year 1922, pp. 66-67.

make-up of the report can easily be determined on. At the present time, they seem to be published for a variety of reasons. Pearl, in a facetious way, speculates as to why the statistics as given in the average annual report are published. He[4] says:

"I believe the clue is found in the history of the matter. Hospitals began as public or private charities, to the support of which financial contributions were solicited. The evolution of human nature having proceeded no farther than it had, it was felt necessary to furnish at frequent intervals documentary evidence of the moral rectitude of those persons responsible for the disbursement of the donated funds. The best possible evidence that some one has not absconded, or misused the institution's resources, is statistical proof that the hospital has been performing its proper function of admitting, treating and discharging patients. Beyond this essentially moral purpose, it is difficult to discover that the type of purely routine hospital statistics now referred to has, will or can serve any useful purpose."

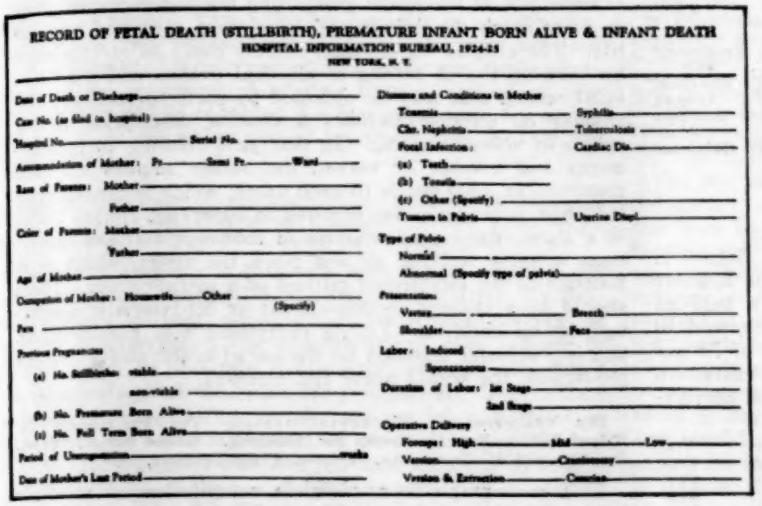

RECORD OF FETAL DEATH (STILLBIRTH), PREMATURE INFANT BORN ALIVE & INFANT DEATH
HOSPITAL INFORMATION BUREAU, 1924-25
NEW YORK, N. Y.

Fig. 2.—Front of certificate for obstetric records.

If the results of therapeutic efforts of hospitals were presented in a uniform way by a considerable number of institutions throughout the country, a valuable contribution to medical science would be made. Realizing the slowness of agreement on a uniform nosology and method of tabulating, Dr. Charles F. Bolduan[5] suggested a method of obviating the inherent difficulties. In brief, this plan provided for uniform discharge certificates to be adopted by a group of hospitals desiring to pool their statistical experience, these certificates to be edited by a medical registrar in the same way that death certificates are edited by a registrar of vital statistics. The value of this method is that it makes possible the preparation of uniform statistics from different hospitals without waiting for the adoption of a uniform nomenclature and system of recording. This plan was endorsed some time ago by a special committee formed in New York, and the Metropolitan Life Insurance Company was at that time ready to grant a certain amount of money for the conduct of an experiment. Several hospitals in New York City agreed to participate, but owing to the supervening war and some minor difficulties the plan was not carried out.

4. Pearl, Raymond: Modern Methods in Handling Hospital Statistics, Bull. Johns Hopkins Hosp. **32**: 184 (June) 1921.
5. Bolduan, C. F.: Hospital Morbidity Statistics: A Practicable Method of Making Them Uniform and Preparing Them for Analytic Study, New York City Department of Health, April, 1913.

When the Hospital Information Bureau of the United Hospital Fund was organized in 1921, the matter was revived, and a central statistical service was offered to a group of hospitals in the city. The actual work began in 1923, with six hospitals participating by sending to the bureau certain information concerning their discharged patients on a uniform certificate, a copy of which is reproduced in Figure 1, and which was an adaptation, with slight modification, of the form proposed by the statistical committee mentioned above.

When received by the bureau, the data are transferred to punch cards, and are ready for tabulation and the working out of correlations. The tabulation of numerous tables based on the 30,000 cases for which information was received in 1923 is being completed and will be presented in a series of papers.

The principal tabulations link the condition of the hospital patient with his age, race, occupation and associated complications. Many additional correlations are chiefly of sociological significance and of value to the administrative authorities of the hospitals.

Recently, a group of obstetricians in New York, realizing the value of comparative statistics, asked the bureau to act as a repository of information concerning certain phases of obstetric experience. A certificate has been prepared, a copy of which is reproduced in Figures 2 and 3, and ten institutions have agreed to send in periodically information about the cases of stillbirths and prematurity and infant deaths for a uniform tabulation by the bureau.

The bureau has no assured means for continuing this work or expanding it beyond the demonstration period of another year. It is hoped that by that time the value of such central statistical work to the community and to medical science, as well as to the hospitals, will be considered sufficiently demonstrated to provide a method of joint financing, which will make possible the work on a large scale comprising the majority of the hospitals in New York City. Such a joint statistical service is not only more valuable from the point of view of valid contributions it can make to medical and hospital science but also is more economical than if individual hospitals endeavored to do it independently.

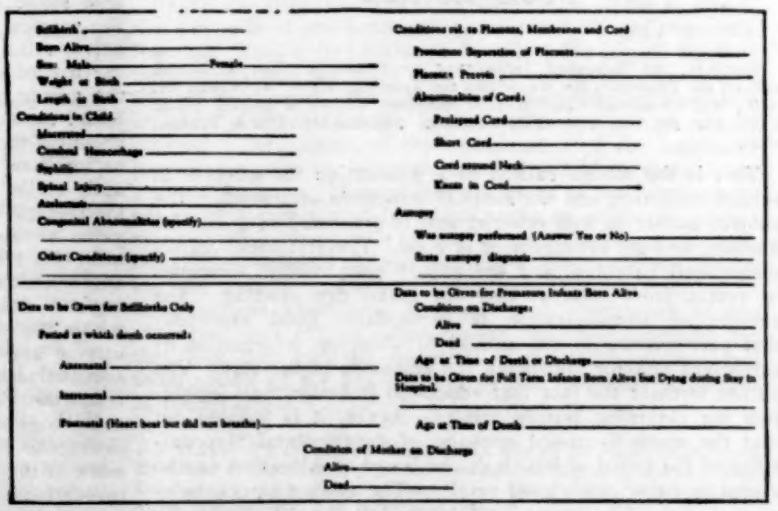


Fig. 3.—Back of certificate for obstetric records.

15 West Forty-Third Street.

Arizona April Examination

Dr. W. O. Sweek, secretary, Arizona Board of Medical Examiners, reports the written examination held at Phoenix, April 1, 1924. The examination covered 10 subjects and included 100 questions. An average of 75 per cent. was required to pass. One candidate, an osteopath, was examined and passed. One candidate, also an osteopath, was licensed without examination. Five candidates were licensed by reciprocity. The following colleges were represented:

PASSED	Per Cent.
Osteopath	*

LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Maryland	(1918)	Maryland
University Medical College of Kansas City	(1902)	Oregon
Columbia University	(1914)	Alabama
Western Reserve University	(1920)	Utah
Memphis Hospital Medical College	(1904)	Oklahoma

* No grade given.

Delaware June Examination

Dr. H. W. Briggs, secretary, Medical Council of Delaware, reports the written and practical examination of the Regular and Homeopathic Boards of Medical Examiners held at Wilmington, June 17-19, 1924. The examinations covered 10 subjects and included 100 questions. An average of 75 per cent. was required to pass. Of the 7 candidates examined, 6 passed and 1 failed. One candidate was licensed by reciprocity. The following colleges were represented:

PASSED	Year Grad.	Per Cent.
Hahnemann Med. College and Hospital of Philadelphia	(1923)	92
Jefferson Medical College	(1922)	88.2
Temple University	(1920)	79.9
University of Pennsylvania	(1923)	85.5
Woman's Medical College of Pennsylvania	(1923)	82.6
University of Frankfort-on-the-Main, Germany	(1920)*	79.7

FAILED	Year Grad.	Per Cent.
University of Jurjev, Russia	(1916)*	70.8

LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Medico-Chirurgical College, Philadelphia	(1915)	Penna.

* Graduation not verified.

Book Notices

MEDICAL AND SANITARY INSPECTION OF SCHOOLS. For the Health Officer, the Physician, the Nurse and the Teacher. By S. W. Newmayer, A.B., M.D., Assistant Chief Medical Inspector, Bureau of Health. Cloth. Price, $4. Pp. 462, with 85 illustrations. Philadelphia: Lea & Febiger, 1924.

This is the second edition of a publication for workers in school sanitation and the medical inspection of schools. The subject matter is well covered and is presented in a concise manner, and the arrangement is good. The statistical matter seems well balanced, and the author cites enough examples to retain one's interest and not make dry reading. The chapter on administration is particularly good, especially that part relating to the method of obtaining information of employees and for improving the efficiency of the staff. The author stresses the fact that education is better than legislation for obtaining lasting results. Again, it is pointed out that the much discussed question of departmental responsibility of the board of health or the board of education can be vested in either, with good results. The author agrees, however, that the department least dependent on political activity and most successful in obtaining appropriations achieves the best results. One must agree with him that medical work in schools is the physician's responsibility, and should not be placed on teachers or nurses. The ideal system proposed should require a thorough physical examination before a pupil is enrolled. On the other hand, children should be examined as frequently as possible; that is, every one or two years, so that preventive advice may be given, thus rendering curative efforts unnecessary. It is rightly indicated that inspection should include both teachers and janitors. School construction, plumbing and drainage, toilets and urinals, and the water supply are touched on briefly; ventilation and heating rather fully. The author discusses special types of classes, as open air, orthopedic, ocular, and those for deaf and backward children. The chapter on communicable diseases could be enlarged. In diphtheria it is recommended that classes be dismissed after cultures are taken. The value of such a procedure is questionable. Physical daily examinations of pupils is usually impossible, and the use of the "instructed teacher" for diagnostic purposes is recommended. The weight of present opinion seems to point to the value of physical examination in the lower grades and the concentration there so as to catch the defects and have them corrected early in life. The chapter on physical defects could be strengthened by showing the ill results of physical defects and the beneficial results that may be obtained by their correction. The chapter on nursing includes a concise description of the origin of school nursing. In that part relating to appointments and number of nurses, the author implies an ideal condition of 3,000 pupils to each nurse, which is considerably less than most nurses are required to supervise. In the duties of a nurse, the author employs in routine classroom inspections a nurse walking up and down the aisles, which is in contrast to the established method of a private room. There should be a chapter on deportment or behavioristic characteristics of children. Taking everything into consideration, this is a valuable textbook for the use of health officers, school physicians, the school nurse and teachers.

DIE THERAPIE DES WOCHENBETTFIEBERS. Von Privatdozent Dr. Robert Köhler, Em. Assistenten der Abteilung. Second edition. Paper. Pp. 176, with 27 illustrations. Leipsic: Franz Deuticke, 1924.

This monograph is a complete compilation of available knowledge of its subject. After a careful reading, however, the conviction emerges that, with the large number of surgical and medical methods advocated by authorities for the treatment of puerperal sepsis, the one essential requisite is the discovery of a specific therapy that will be effective under all conditions. Some secure a high incidence of recovery by expectant methods, in septic abortion, for example, while others obtain comparable results by radicalism of operation. Neither, therefore, fulfils the purpose suggested. Dr. Köhler has accumulated a remarkable array of information on the treatment of puerperal sepsis. He has divided the subject under the main captions prophylaxis and therapy. Considerable space is allotted to the consideration of hysterectomy, the surgical treatment of peritonitis, and the ligation of the pelvic veins. The medical treatment includes a discussion of the use of antiseptics (intravenous injections of sublimates, the quinin group, formaldehyd preparations, iodins and colloidal metals). Many pages are given to the elucidation of chemical therapy, including the preparations that are reputed to increase leukocytosis, and bacterial therapy. Dr. Köhler aptly states that most of the vast production of literature on the therapy of sepsis has a pragmatic place rather than actual value to the patient with puerperal sepsis. This manifestly must be true until the specific is discovered. American authorities have long recognized that the bacteria of the vaginal discharges are relatively innocuous; the bacteria within the tissues themselves are the offenders, so that intrauterine and vaginal douches are of no avail, and generally are distinctly harmful, for no fluid, however, antiseptic, may reach the bacteria buried in the living tissues. In America one recognizes only the dangers of curettage, with no benefits, in sepsis. The author's statement that the only indication for entry of the uterus at term, in the presence of sepsis, is severe hemorrhage is heartily approved, but his recommendation of the nearly routine curettage of the septic uterus in the first three months of pregnancy is hardly likely to be accepted. Nor can we understand why retained decidua is a menace demanding operative removal, while the retained secundines at term must be left strictly alone. His position that the only indications for the removal of the uterus are necrotic myoma and perforations of that organ is approved, but routine laparotomy, with drainage, for peritonitis is a doubtful procedure: the mortality, at best is so high that, by the time the operation is undertaken, the patient is so compromised that in the main expectancy dictates the American procedure. The value of resection of the pelvic veins is still a question. In

the clinic of his chief, Professor Halban, resection is done, if a thrombotic vein is palpable. The future scientist will probably develop three things that will solve the sepsis problem: (1) a definite method for the determination of bodily resistance to all bodily invasion of bacteria—as was promised by the opsonic index of Wright; (2) a specific prophylaxis for the bacteria ordinarily found in puerperal sepsis as well as that of surgical infections, as is the case with the typhoid vaccine, and (3) specific therapies for these bacteria, as is true with diphtheria, and a few other bacterial diseases. Until these are discovered, we all must discuss the treatment of puerperal sepsis in an empiric way. The bibliography is so extensive, covering seventeen pages (from the year 1903), that one need hardly go further for references to the modern methods advocated for the treatment of sepsis. Future editions of this monograph would be enhanced if a few pages were devoted to a summary of the principles of treatment employed in the Halban clinic.

HOSPITAL ORGANIZATION AND OPERATION. By Frank E. Chapman, Director, Mount Sinai Hospital of Cleveland. Cloth. Price, $3.50. Pp. 270, with charts. New York: Macmillan Company, 1924.

The fifteen chapters in this book give suggestions and aid in the solution of hospital administrative problems. It contains a series of charts showing different schemes or types of internal organization. The adaptability of each scheme to different types of hospitals is discussed, and the advantages and shortcomings of each plan are pointed out. The ultimate and entire responsibility for the policies of a hospital is placed with the board of trustees, of which the superintendent is an ex officio member and who has final authority to administer the policies of the board. The medical staff is responsible for the medical policies of the hospital, subject to the direction of the board. One chapter is devoted to the medical staff, and considerable attention is given throughout the book to the relation of the physician to the hospital. Necessarily, much that is important in this connection has been omitted, since an adequate discussion of staff problems alone would fill a volume. A valuable feature is a complete outline of accounting procedure; a similar outline is given in regard to records. The many hints on the handling of personnel should be of real assistance to hospital superintendents. Conditions peculiar to the organization and the operation of a small hospital are given special attention. There is also a chart showing the organization of small hospitals. The book is carefully indexed so that items in regard to which information is desired can be readily referred to.

PECULIARITIES OF BEHAVIOR. Wandering Mania, Dipsomania, Cleptomania, Pyromania and Allied Impulsive Acts. In two volumes. By Wilhelm Stekel. Authorized English Version by James S. Van Teslaar. Cloth. Price, $8.50 per set. Pp. 669 inclusive. New York: Boni & Liveright, 1924.

These two volumes constitute the first of a complete series by Dr. Stekel, who is rather widely known as a writer on psychanalysis as related to medical practice. The present books concern wandering mania, dipsomania, kleptomania, pyromania and allied impulsive acts. Future volumes are to cover the subjects of male impotence, frigidity of women, and psychosexual infantilism. It is, of course, the belief of Dr. Stekel that the sexual life is fundamental to all human activities. From some of the simplest acts of childhood and youth, he traces the disordered actions of the adult. It is, conversely, his belief that a proper direction of the thoughts and actions of childhood will likewise lead to proper mental and social adjustments. He writes in a somewhat exuberant style, and summons to his support a vast literature of cases compiled not only from his own experience, but also from the available medical and lay literature. The larger part of the first volume is taken up by the report of one case of delirium, which occupies more than a hundred pages. The remainder deals largely with the sexual basis for stealing and drug addiction. The second volume is a conglomeration of cases of stealing, arson, gambling and various tics, all of which Stekel believes are the fulfilment of unsatisfied sexual desires. It would be futile to deny that the observations of Dr. Stekel are of great interest. This is a period in which psychiatrists and psychologists are concerned with problems of education with an intensity seldom equaled at any previous period in the development of these sciences. No doubt, more conservative observers in these fields will feel that Stekel has overstressed certain elements in his analyses—as he undoubtedly has—and that he makes far too much of his case reports. Nevertheless, he has attracted wide attention by his sparkling, if not sensational, style, and will have a wide hearing. Unfortunately, those better fitted by scientific knowledge, judgment and restraint, to write about these matters, are not quite so well fitted in literary presentation.

A PRACTICAL TEXT-BOOK OF INFECTION, IMMUNITY AND BIOLOGIC THERAPY. With Special Reference to Immunologic Technic. By John A. Kolmer, M.D., Dr.P.H., D.Sc., Professor of Pathology and Bacteriology in the Graduate School of Medicine, University of Pennsylvania. With an Introduction by Allen J. Smith, M.D., Sc.D., LL.D., Professor of Pathology in the School of Medicine of the University of Pennsylvania. Third edition. Cloth. Price, $12 net. Pp. 1210, with 202 illustrations. Philadelphia: W. B. Saunders Company, 1923.

The last edition of this book appeared six years ago. In the present edition, most of the chapters are rewritten and new ones have been added. Chemotherapy is not discussed, because the author intends to publish such material as a separate book. The volume is particularly valuable to the student of medicine as well as to practitioners, not only because of the emphasis it places on theoretical conceptions, but also because of its greatly detailed accounts of the simplest forms of laboratory procedure and practical application to the patient. For example, in describing the way in which blood is drawn from a finger, there is adequate illustration and special emphasis on the advice that the lancing be done across the folds of skin. Rarely does the author describe any procedure, method or apparatus that he has not selected as the most advantageous and most generally accepted. In the description of the precipitin reaction, however, the tubes recommended seem too large for the best results. Extensive consideration is given to the diagnostic and therapeutic applications of various immunologic methods, and such subjects as the tuberculin tests and pollen reactions are given thorough discussion. In its field, the Kolmer book has achieved a place of outstanding importance.

DIE FUNKTIONSPRÜFUNG DES AKUSTISCHEN UND STATISCHEN LABYRINTHS. Von Dr. Maximilian Rauch. Paper. Price, 60 cents. Pp. 71, with 12 illustrations. Vienna: Julius Springer, 1924.

Rauch has endeavored to cover the subject of the examination not only of the hearing apparatus but also of the static function. Tuning fork tests are described, but a good many of the modifications that have been suggested during recent years are not mentioned. Next there is a discussion of simulated unilateral deafness, but the important Stenger test is entirely omitted. The subject of the examination of the vestibular function is covered in much more detail than that of the acoustic function. Illustrations are given of the labyrinth by means of Rauch's models, which serve to make the subject more easily understood. In one of the concluding chapters, the author considers the various pathologic conditions involving the auditory apparatus; also some of the intercranial complications which may be present. A short work of this character does not, of course, cover the subject deeply; but this book does give the essentials of the ordinary functional examination of the hearing and of the vestibular apparatus of the inner ear.

A DIABETIC MANUAL FOR THE MUTUAL USE OF DOCTOR AND PATIENT. By Elliott P. Joslin, M.D., Clinical Professor of Medicine, Harvard Medical School. Third edition. Cloth. Price, $2. Pp. 211, with 19 illustrations. Philadelphia: Lea & Febiger, 1924.

Education of the diabetic patient as a necessary part of the treatment of his condition is recognized as a vital part of the control of the disease. In this education, Dr. Joslin has had an important share, not only in the preparation of one of the first satisfactory guide books for the patient, but also in the contribution of numerous popular articles, which have brought home important facts to aid in the prevention as well as the care of this disease. The present book is written in a pleasing style, and will be found invaluable by any diabetic patient who is willing to live in such a manner as to prolong his life.

Medicolegal

May Require Roentgen-Ray Examination Before Trial

(Hollister v. Robertson (N. Y.), 203 N. Y. Supp. 514)

The Supreme Court of New York, Appellate Division, Third Department, says it thinks that it should express its present views on the question of the power of the court under Section 873 of the Code of Civil Procedure; Civil Practice Act, Section 306, to require a roentgen-ray examination as a part of a physical examination before trial. There were various elements considered by this court in deciding the case of *Lasher* v. *S. Bolton's Sons*, 161 App. Div. 381, 146 N. Y. Supp. 321. So far, however, as the opinion of this court in that case indicated that the court was without power to require such a roentgen-ray examination, this court is unwilling to follow it. That decision was rendered just ten years ago, and since that time there has been such a perfection of the science of taking such roentgen-ray pictures that their use, particularly in determining the presence and extent of bone injuries, has become a matter of universal use and the accepted method in the best medical practice. Any danger of burning or other bodily injury, when proper apparatus is used and skilful practitioners are employed, has apparently been eliminated. This court's present view is that it is not beyond the power of the court to require it in a proper case, but that its use may be required under proper safeguards whenever, in the exercise of its discretion, the court deems that the issues between the parties and the advancement of the science of the use of such apparatus fairly indicate the justice of requiring it in any particular case.

In this case the original order required a resident plaintiff to be examined outside the state. In that respect the order was without authority. The order appealed from, which set aside the original order, vacated it without prejudice to a renewal, by the defendant, of her motion for the plaintiff's physical examination. This court thinks it should affirm this order and leave the decision of the merits to the Special Term. On new papers, that court will be able to fix proper restrictions and directions, if the roentgen-ray examination is allowed.

Title to Act Requiring Reporting of Venereal Diseases

(People v. Wohlford (Mich.), 197 N. W. R. 558)

The Supreme Court of Michigan says that the defendant was convicted of a violation of the provision of Act 272, Public Acts of 1919 of that state, requiring physicians to report any case of venereal disease treated by them to the state department of health. The trial court set the conviction aside on the ground that the object of the act is not expressed in the title, as required by the constitution of the state. The title to the act is: "An act to protect the public health; to prevent the spreading of venereal diseases, to prescribe the duties and powers of the state department of health and of local health officers and health boards with reference thereto, and to make an appropriation to carry out the provisions hereof." The purpose of this act is clearly indicated in the first words of the title: "An act to protect the public health." The language that follows is suggestive that such protection is to be afforded by preventing the spread of venereal diseases, and that certain duties and powers are conferred on the state department of health to accomplish this result. The general purpose is clearly expressed. The means for its accomplishment are clearly stated. In the supreme court's opinion, it is sufficiently broad to permit the enactment of the several provisions that follow it. It is a well known fact that venereal diseases are communicable. Their spread can be prevented only by the segregation of the persons affected or other means known only to physicians and to the health authorities. The supreme court thinks that a physician reading the title to this act would know that it probably contained provisions relative to his treatment of such diseases. These diseases, as a rule, are treated only by physicians, and an act to protect the public health by prevention of their spread would seem necessarily to contain provisions regulating their conduct in such treatment. The title is certainly sufficient to give them notice that their interests are likely to be affected by the provisions of the act, and that is all that the constitutional provision requires in this respect. Wherefore the supreme court holds that the judgment entered must be set aside, and the trial court must proceed to sentence.

Allegations in Action for Services to Third Person

(Powell v. McGee (Texas), 258 S. W. R. 257)

The Court of Civil Appeals of Texas, in reversing a judgment that sustained a general demurrer to the plaintiff's petition under which he was seeking to recover about $240 for medical services, medical supplies and nursing for one Ida Hartman, says that he alleged that he furnished these items to her at the special instance and request of the defendant, and that the defendant promised him to pay for them, whereby the defendant became liable to him for the respective amounts which the plaintiff alleged constituted the reasonable value of the services rendered. There was no suggestion in the plaintiff's petition that he furnished any of the items sued for on the credit of Ida Hartman, and that he was looking to the defendant to pay the debt of Ida Hartman. No construction could be given to the plaintiff's allegations, except that of an original undertaking on the part of the defendant to pay for the items sued for. For this reason the trial court erred in sustaining a general demurrer to the plaintiff's petition, the court apparently acting on the theory that the plaintiff's cause of action was within the statute of frauds requiring undertakings to answer for the debts of others to be evidenced in writing.

The plaintiff also alleged a liability against the defendant on the theory that Ida Hartman was a dependent member of the defendant's family, and that the defendant was legally and morally responsible for necessities furnished her. This allegation was excepted to on the ground that the facts of dependency were not alleged, which exception was correctly sustained. If, on another trial, the plaintiff should desire to rely on this allegation, he should so amend his petition as to reflect the facts making the defendant liable for necessities furnished Ida Hartman.

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Oto-Laryngology, Montreal, Canada, Sept. 15-20. Dr. Luther C. Peter, 1529 Spruce Street, Philadelphia, Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Cleveland, Sept. 18-20. Dr. James E. Davis, 111 Josephine Avenue, Detroit, Secretary.

American Association of Railway Surgeons, Chicago, Oct. 15-17. Dr. Louis J. Mitchell, 29 East Madison Street, Chicago, Secretary.

American Child Health Association, Kansas City, Mo., Oct. 15-17. Dr. Philip Van Ingen, 125 East 71st Street, New York, Secretary.

American Electrotherapeutic Association, New York, Sept. 9-12. Dr. Richard Kovacs, 223 E. 68th Street, New York, Secretary.

Colorado State Medical Society, Denver, Oct. 7-9. Dr. F. B. Stephenson, Metropolitan Building, Denver, Secretary.

Delaware State Medical Society, Milford, Oct. 14-15. Dr. W. O. LaMotte, Industrial Trust Building, Wilmington, Secretary.

Indiana State Medical Association, Indianapolis, Sept. 24-26. Dr. Charles N. Combs, 221 South 6th Street, Terre Haute, Secretary.

Kentucky State Medical Association, Louisville, Sept. 23-25. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

Medical Association of the Southwest, Kansas City, Mo., Oct. 13-18. Dr. E. H. Skinner, Rialto Building, Kansas City, Mo., Secretary.

Michigan State Medical Society, Mount Clemens, Sept. 9-11. Dr. F. C. Warnshuis, Powers Theatre Building, Grand Rapids, Secretary.

Minnesota State Medical Association, St. Cloud, Oct. 8-10. Dr. Carl B. Drake, Guardian Life Building, St. Paul, Secretary.

Missouri Valley Medical Society of the, Des Moines, Sept. 17-19. Dr. Charles W. Fassett, 115 E. 31st Street, Kansas City, Mo., Secretary.

North Dakota State Medical Association, Bismarck, Sept. 10-11. Dr. H. J. Rowe, 5211 Upton Avenue, S., Minneapolis, Minn., Secretary.

Pennsylvania, Medical Society of the State of, Reading, Oct. 6-9. Dr. W. F. Donaldson, Jenkins Arcade, Pittsburgh, Secretary.

Vermont State Medical Society, Burlington, Oct. 9-10. Dr. W. G. Ricker, St. Johnsbury, Secretary.

Virginia, Medical Society of, Staunton, Oct. 14-17. Miss Agnes V. Edwards, 104½ West Grace Street, Richmond, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL for a period of three days. No foreign journals are available prior to 1920, nor domestic prior to 1923. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested).

Titles marked with an asterisk (*) are abstracted below.

American Journal of Hygiene, Baltimore

4: 241-409 (July) 1924

Larval Flukes from China. II. E. C. Faust, Baltimore.—p. 241.
Life Tables for Population of New York State. J. V. Deporte, Baltimore.—p. 302.
*Leptospira Icterohemorrhagiae in Wild Rats of Baltimore. G. H. Robinson, Baltimore.—p. 327.
*Mortality of Chinese in United States, Hawaii and Philippines. C. E. A. Winslow and Z. W. Koh, New Haven, Conn.—p. 330.
*Biseasonal Prevalence of Infantile Paralysis. W. L. Aycock and P. Eaton, Boston.—p. 356.
*Maternal and Infant Mortality in Physicians' Families. H. Emerson, New York.—p. 365.
Origin of Pellucid Areas on Agar Cultures of Spore-Bearing Bacteria. H. Andervont and C. E. Simon, Baltimore.—p. 386.
*Carnivorous Diet and Mammalian Infections with Intestinal Protozoa. R. W. Hegner, Baltimore.—p. 393.

Leptospira in Rats of Baltimore.—About 7 per cent. of the wild rats of Baltimore were found by Robinson to be infected with *Leptospira icterohemorrhagiae*. The leptospiras were found in dense masses in certain tubules of the kidney. The urine was generally heavily infected. All of the infected rats were old, full grown animals. It was noted that the animals bearing traumatic scars were most likely to be infected. Therefore, it is possible that wild rats are normally infected through abrasions of the skin.

Mortality of Chinese in United States and Possessions.—Winslow and Koh found that the crude death rate of the Chinese in the United States is very high (27.1 per thousand, for the states of California, Oregon and Washington in 1919-1920, as against 12.4 for the total population of these states). In the city of Manila the crude mortality for the Chinese is much lower than in the United States, and in Hawaii it is lower still. The comparative figures for 1920 are: registration states, 24.3; Manila, 18.4; Hawaii, 16.9. In both Manila and Hawaii the Chinese rates are intermediate between those for Caucasians and those for the native races (Hawaiian and Filipino). Analysis of deaths by cause indicates that the Chinese in all three regions studied exhibit a consistent and apparently characteristic excessive mortality from tuberculosis, from circulatory diseases and from genito-urinary diseases, as compared with Caucasians. It would appear that so far as these diseases are concerned inherent physical characteristics or racial habits must exert a specific predisposing influence. The excessive mortality from acute respiratory diseases and from external diseases which appear among the Chinese in the coast states are, on the other hand, apparently due to local climatic or social and environmental conditions or to the particular type of Chinese represented in the United States, since death rates from these causes are not excessive in Hawaii or in Manila.

Biseasonal Prevalence of Infantile Paralysis.—The seasonal prevalence of infantile paralysis in the United States over a period of eleven years (1912-1922) has been studied by Aycock and Eaton. There is a marked regularity in the summer prevalence of the disease. A definite secondary increase in its occurrence, usually in March or April, has been established. This increase occurs with fair regularity from year to year, and with a certain degree of uniformity in all parts of the country. This suggests the possibility of two modes of transmission of infantile paralysis.

Maternal and Infant Mortality in Physicians' Families.—In spite of the errors inseparable from dealing with a small experience involving 1,974 pregnancies and 1,910 living children in the families of physicians in the United States, it would seem from Emerson's study that the maternal risk rate and the infant mortality rate in these families are far below any that have so far been reported during the same period of time for the communities in which the majority of these families lived, namely the larger cities of the eastern United States. There is no evidence that this apparent superiority of protection in physicians' families is due solely or chiefly to better professional care provided in these households, as comparable data for families of lawyers, teachers and other persons of presumably equal cultural acquirements and equal or more favorable economic status have not been obtained. It is, however, in all probability true that the facts of preventive medicine so far as they affect the survival of mothers from pregnancies and the escape of infants from the hazards of early life, are better understood and more commonly and effectively used in physicians' families than among other professional groups in the community.

Carnivorous Diet Unfavorable to Intestinal Protozoa.—Data from various sources described by Hegner seem to prove that a carnivorous diet is unfavorable for the intestinal protozoa of mammals. Work is now in progress designed to test the value of a carnivorous diet in cases of human amebiasis, giardiasis and trichomoniasis.

American Journal of Physiology, Baltimore

69: 211-454 (July) 1924

Peristaltic Rush in Rabbit. W. C. Alvarez and L. J. Mahoney, San Francisco.—p. 211.
Peristaltic Rush Depicted in Electro-enterogram. W. C. Alvarez and L. J. Mahoney, San Francisco.—p. 226.
*Myenteric Reflex. W. C. Alvarez, San Francisco.—p. 229.
Electrode and Clamp for Gastro-Intestinal Work. W. C. Alvarez, San Francisco.—p. 249.
Reactions of Young Decerebrate Animals. O. R. Langworthy, Baltimore.—p. 254.
Reactions of Intestinal Segments to Mechanical Stimulation. R. G. Hoskins and E. S. Hunter, Columbus.—p. 265.
*Effect of Ingested Epinephrin Chlorid on Basal Metabolism. F. A. Hitchcock, Columbus.—p. 271.
*Locomotion of Leukocytes. III. Rate of Human Lymphocytes in Vitro. M. McCutcheon, Philadelphia.—p. 279.
Electrical Records of Afferent Nerve Impulses from Muscular Receptors. A. Forbes, C. J. Campbell and H. B. Williams, Boston.—p. 283.
Effect of Anesthetics on Catalase Content and Oxygen Consumption of Unicellular Organisms. W. E. Burge, Chicago.—p. 304.
*Heat Regulation in Rabbits. R. W. Keeton, Chicago.—p. 307.
Acid Response and Basal Secretion of Stomach. R. K. S. Lim, Chicago.—p. 318.
*Blood Diastase. II. Are Blood Diastases End Products of Metabolism? S. J. Cohen, Chicago.—p. 334.
Color Phenomena. G. N. Stewart, Cleveland.—p. 337.
Secondary Excitation in Retina. W. R. Amberson, Philadelphia.—p. 354.
Studies on Physiology of Liver. F. C. Mann, J. L. Bollmann and T. B. Magath, Rochester, Minn.
*VIII. Effect of Total Removal of Liver on Formation of Urea.—p. 371.
*IX. Formation of Bile Pigment After Removal of Liver.—p. 391.
Circulatory Responses to Exercise in Man; Diastolic Heart Tone. H. L. White, St. Louis.—p. 410.
Effect of Endocrine Preparations on Muscular Work. N. B. Eddy, Edmonton, Canada.—p. 432.
Physiologic Maximum Rate of Heart. J. Tulgan, New York.—p. 441.
Effect of Adrenalin on Patellar Tendon Reflex. W. W. Tuttle, Columbus.—p. 446.

Mesenteric Reflex.—The studies reported on by Alvarez show how important it is to use a smooth residueless diet in many gastro-intestinal diseases. Suggestions are offered to explain some of the workings of the myenteric reflex. It is a question whether it is actually a reflex.

Effect of Epinephrin on Basal Metabolism.—In ten out of eleven experiments on adult men the oral administration of epinephrin chlorid, in doses of from 3 to 10 mg., was followed by a rise in the metabolic rate. The average increase was 6.9 per cent. It is believed by Hitchcock that this rise was caused by the absorption of adrenalin from the stomach and probably the upper intestine, and the extent of the rise indicates that the amount absorbed was of the order of 1.7 per cent. of the quantity ingested although wide variations between different individuals were noted. Doses of 5 mg. or more in some subjects cause severe gastric disturbances.

Locomotion of Leukocytes.—The prevailing opinion that lymphocytes are capable of only extremely slow motion McCutcheon found to be erroneous, and probably due to too brief periods of observation.

Insensible Perspiration.—The data obtained by Keeton suggest that "insensible perspiration" in man is due to a direct vaporization of water from the tissues.

Blood Diastase.—Cohen concludes that the diastases in the blood are not entirely useless nor end products of metabolism. They circulate in the blood. Some of them must be eliminated by the kidney, but the greater portion lie in readiness to be used in cases of emergency or increased need for their action.

Effect of Hepatectomy on Urea.—Studies on the effect of total removal of the liver on the formation of urea have been made by Bollman, Mann and Magath in more than ninety dogs, in which the results have not been complicated by loss of large amounts of blood or anesthesia while under observation. It was found that the production of urea in the body of the dog is entirely dependent on the presence of the liver, since urea formation ceases completely as soon as the liver is removed.

Formation of Bile Pigment After Hepatectomy.—Mann et al. assert that the results of their experiments showed conclusively that there accumulates in the body after removal of the liver a pigment which in all its characteristics appears to be bilirubin. They were unable to determine where the pigment is formed. Its formation is not dependent on any of the intra-abdominal organs because it accumulates at approximately the same rate after they have all been ablated. The pigment accumulates progressively. It is usually noted in the first specimen of urine secreted after hepatectomy. In from three to six hours after the liver is removed, the plasma becomes yellow tinged. In animals that live sixteen hours or more, the sclera becomes tinged with yellow. At necropsy all the fatty tissue of the body is a dirty yellow color. This yellow pigment gives a positive reaction for bilirubin. Its rate of development, under certain conditions, is accelerated by the intravenous injection of laked blood. The liver is not essential for the formation of bilirubin. It would seem highly probable that normally a high percentage of the bile pigment excreted by the liver is of extrahepatic origin.

American Journal of Public Health, New York

14: 561-646 (July) 1924

Cancer and Health Administrator. E. R. Kelley, Boston.—p. 561.
Elements of Complete Mortality and Morbidity Report. H. Emerson, New York.—p. 566.
Hygiene of Wrestling Mats. W. L. Mallmann, East Lansing, Mich.—p. 569.
Preventing Rickets in Italian District in New York. J. C. Gebhart, New York.—p. 571.
Outbreak of Typhoid Fever Due to Infected Ice. J. A. Conway, Hornell.—p. 574.
*Experimental Relation of Bacteria of Paratyphoid-Enteritidis Group to Poisonings by Food. J. C. Geiger, E. Davis and H. Benson, Chicago.—p. 578.
Graphs in Public Health Reports. H. T. Larsen, Urbana, Ill.—p. 585.
Periodic Health Examinations. A. N. Thomson, Brooklyn.—p. 592.
City Health Department in Health Examination Campaign. G. C. Ruhland, Milwaukee.—p. 594.
*Clinical Effects of So-Called Moonshine Liquors. F. J. Gerty, Chicago.—p. 603.
*Examination of Sputum for Tubercle Bacilli. P. Castleman, Boston.—p. 610.

Relation of Bacteria to Food Poisoning.—Normal cans of food inoculated with six strains of *Bacillus paratyphosus* A, B, C, two strains each of *B. enteritidis* and *B. vulgaris* (proteus) and incubated at 37 C. for ten days, showed decided growth increase to occur in many foods. Occasional changes in texture and odor of the food and changes in the appearance of the container take place which would ordinarily cause the food to be discarded. For instance, cans of corn and potted ham inoculated with *B. paratyphosus* A, B, C, and *B. vulgaris* (proteus) and then incubated became swells, but these foods were not affected by the growth of *B. enteritidis*. Containers of salmon became swells, when inoculated with *B. paratyphosus* A and B, but not with the other organisms used. Containers of peas and peaches became swells when inoculated with *B. paratyphosus* B. There were no noticeable changes in any of the containers of food inoculated with *B. enteritidis*. Rabbits fed with food so inoculated and with boiled and untreated filtrates of these contaminated foods occasionally developed symptoms of diarrhea, etc.

Nature of Moonshine Poisoning.—For practical purposes we must consider moonshine poisoning as alcoholism of a modified or aberrant type. It is a very prevalent form of poisoning at present, and in Chicago, at least, is as frequently found as alcoholism was in the prewar and preprohibition periods. The physical and mental morbidity and the mortality are high. The type of poisoning seen differs from ordinary alcohol poisoning in the following ways: (*a*) The poison takes effect more rapidly, and the patient is brought to the hospital sooner because of the gravity of his symptoms. A smaller amount of the prevalent beverages is required to incapacitate. (*b*) The effect is more profound and more often fatal. (*c*) Mental deterioration is a common sequel even after a few sprees. (*d*) As far as the mental symptoms are concerned the clinical picture is usually blurred, thus making classification of cases more difficult. (*e*) Pneumonia has not so frequently been associated with the present form of poisoning as with alcoholism in the past. (*f*) Cirrhosis does not appear to be associated with the present form of alcoholism as it was with alcoholism in the past.

Examination of Sputum for Tubercle Bacilli.—Castleman describes a combined shaking antiformin method which is said to give a higher percentage of positive findings, and is not so difficult for the examiner, as the number of bacilli per field is more numerous than by other methods.

American Journal of Roentgenology and Radium Therapy, New York

11: 487-601 (June) 1924

Roentgen-Ray Evidence of Colonic Secondary Changes. R. W. Mills, St. Louis.—p. 487.
Restoration of Colonic Function. H. W. Soper, St. Louis.—p. 503.
*Massive Collapse of Lung: Cases. G. W. Holmes, Boston.—p. 509.
Atelectasis as Roentgen-Ray Sign of Foreign Body in Air Passages. W. F. Manges, Philadelphia.—p. 517.
Osteoma of Sphenoid Bone and Dural Endothelioma: Case. J. D. Camp, Rochester, Minn.—p. 523.
Coolidge Tube Quantitative Variations. G. M. MacKee and G. C. Andrews, New York.—p. 525.
Malignant Growths of Paranasal Sinuses Treated by Irradiation, Electrocoagulation and Other Methods. R. H. Stevens, Detroit.—p. 532.
*Deep Roentgen-Ray and Radium Therapy in Carcinoma of Tonsil. G. W. Grier, Pittsburgh.—p. 537.
Roentgen-Ray Effects. J. B. Murphy, New York.—p. 544.
*Roentgen-Ray Treatment of Keloids. H. H. Hazen, Washington, D. C.—p. 547.
Roentgen-Ray Treatment of Bone Sarcoma. M. B. Palmer, Rochester, New York.—p. 550.

Massive Collapse of Lung.—Holmes reports four cases. In one case a rather extensive abdominal operation was followed in two days by the onset of acute pulmonary symptoms that cleared up rapidly, and in which the clinical picture was not that of postoperative pneumonia. The second case was one of massive collapse of the right lung following operation for hernia under local anesthesia. The third patient was operated on for subacute appendicitis. Ether anesthesia was uneventful except for noisy respirations and some mucus. He coughed considerably during recovery from the anesthetic and on the following day; but otherwise his convalescence was normal until the second day when he had a chill, with the onset of a cough, marked dyspnea and cyanosis. The roentgenogram made three days after operation shows the picture characteristic of massive collapse. The fourth case was one of repair of a bilateral inguinal hernia under epidural anesthesia, the operation being completed in an hour and a half. Cough and purulent sputum began almost at once after the operation. Examination showed dulness throughout the right chest, most marked at the base, with diminished breath sounds and tactile fremitus.

Radiotherapy for Carcinoma of Tonsil.—Grier records ten cases of carcinoma of the tonsil. He first attempted to treat such cases by the use of the roentgen ray alone, directing the ray into the mouth through a speculum and treating the glands externally by roentgen-ray treatment. This treatment was absolutely ineffectual. The next method was the surface application of radium against the primary lesion and the treatment of the neck with the roentgen ray from without. The treatment of the primary lesion in this way was effective, provided the radium could be kept in contact with the lesion for a long enough time. The next step was the use of radium needles instead of radium applied to the surface, which increases the probability of the complete destruc-

tion of the lesion. The metastases in the neck have been treated by: (1) ordinary roentgen-ray methods, either alone or following surgical removal; (2) radium applied externally and also in the wound following surgical removal; (3) deep therapy both before and after surgical removal. The best results have been obtained with deep therapy over the glands of the neck before anything else is done, followed by the use of radium on the primary lesion.

Roentgen-Ray Treatment of Keloids.—Hazen reports favorably on the treatment of keloids by the roentgen ray. The chief risk is that telangiectasia may develop. Small, hard lesions and lesions occurring on the face are extremely difficult to handle. Large lesions probably should be excised and irradiation begun immediately after the operation. Keloids in negroes are more difficult to treat than those in white persons.

Annals of Clinical Medicine, Baltimore

3:1-105 (July) 1924

Treatment of Syphilis from Experimental Point of View. W. H. Brown and L. Pearce, New York.—p. 1.
Neurocirculatory Asthenia. H. Brooks, New York.—p. 11.
Leeuwenhoek, Jenner, Pasteur. D. S. Lewis, Montreal.—p. 21.
*Tumor Thrombosis of Inferior Vena Cava: Four Cases. W. M. Simpson, Ann Arbor, Mich.—p. 29.
*Clinical Auricular Flutter. A. M. Wedd, Pittsburgh.—p. 69.
Ketosis and Carbohydrate Metabolism. P. A. Shaffer, St. Louis.—p. 93.
Possibilities of Thoracic Surgery. E. A. Graham, St. Louis.—p. 96.
Roentgenologic Visualization of Gallbladder. E. A. Graham, St. Louis.—p. 99.

Tumor Thrombosis of Inferior Vena Cava.—Four cases of extensive tumor thrombosis of the inferior vena cava have been found at necropsy in the pathologic laboratory of the University of Michigan. In two of them, renal neoplasms reached the inferior vena cava by direct growth through the renal veins and produced tumor thrombosis in the middle third of the inferior vena cava, i. e., in the portion between the renal and hepatic veins. The third case had its origin in a malignant teratoma testis, with extensive lumbar retroperitoneal metastases. From these metastases direct penetration of the wall of the inferior vena cava occurred. A solid cylinder of new growth filled the lumen for a distance of 5 cm. beginning at a point 4 cm. above the union of the common iliac veins. Induced thrombosis extended to a point just above the entrance of the renal veins. In the fourth case, the primary growth was a carcinoma of the pancreas with metastases to the lumbar chain of retroperitoneal lymph nodes. Direct invasion of the inferior ven cava occurred from these nodes, producing a tumor thrombosis of its lower two-thirds. This case is said to be unique in that it is the only case of vena cava tumor thrombosis from a neoplasm primary in the pancreas. Careful search of the literature reveals seventy-four previously reported cases of tumor thrombosis of the inferior vena cava authenticated by necropsy. Of this number the primary source of the neoplasm was determined in sixty-one cases.

Auricular Flutter.—In 1,200 electrocardiographic examinations reviewed by Wedd, there have been nine cases of flutter, 137 of fibrillation and fifteen of paroxysmal tachycardia. The action of digitalis, atropin and quininidin has been studied and the behavior of flutter under these drugs found to be consistent with the theory and the circus movement. Normal rhythm was restored by quinidin in three of six cases in which that drug was used. It is suggested that in the treatment of flutter the production of fibrillation should be avoided and attempts be made to convert flutter directly to normal rhythm by quinindin or a combination of digitalis and quinidin.

Annals of Medical History, New York

6: 143-244 (June) 1924

Sir William Bowman. B. Chance, Philadelphia.—p. 143.
Surgical Clinic of Charles University, Prague. H. J. John, Cleveland.—p. 159.
Carl Weigert. H. Morrison, Boston.—p. 163.
Lazzaro Spallanzani. G. E. Burget, Portland, Ore.—p. 177.
Sir William Buttes of Norfolk. T. N. Toomey, St. Louis.—p. 185.
References to Syphilis in Plays of Shakespeare. F. R. Packard, Philadelphia.—p. 194.
James Atkinson and His Medical Bibliography. J. Ruhräh, Baltimore.—p. 200.
History of Medicine in Lower Canada. M. Charlton, Montreal.—p. 222.

Annals of Surgery, Philadelphia

80: 1-160 (July) 1924

Intracranial Arteriovenous Aneurysm. C. E. Locke, Jr., San Francisco—p. 1.
*Chronic Productive Thyroiditis. A. V. St. George, New York.—p. 25
Present Status of Surgical Treatment of Chronic Duodenal and Peptic Ulcer. C. H. Peck, New York.—p. 31.
*Prevention of Acute Intestinal Obstruction. C. F. Horine, Baltimore.—p. 42.
*Jejunostomy for Acute Intestinal Obstruction. W. E. Lee and T. McKean Downs, Philadelphia.—p. 45.
*Gunshot and Stab Wounds of Abdomen. W. L. Condict, New York.—p. 51.
Appendiceal Fecal Fistula. J. B. Deaver, Philadelphia.—p. 56.
Cysts of Spleen. R. H. Fowler, Brooklyn.—p. 58.
*Coexistent Nephrolithiasis and Ureterolithiasis on Opposite Sides. W. F. Fowler, Rochester, N. Y.—p. 62.
Knee Joint Injuries; Management. P. H. Kreuscher, Chicago.—p. 69.
Arthroplasty of Knee. W. C. Campbell, Memphis, Tenn.—p. 88.
Fractures About Upper End of Humerus: Seventy-Five Cases. H. E. Santee, New York.—p. 103.
*Idiopathic Osteopsathyrosis. G. W. Wagoner, Philadelphia.—p. 115.
Systemic Blastomycosis. W. H. Cole, St. Louis.—p. 124.

Chronic Productive Thyroiditis.—St. George reports three cases of chronic productive thyroiditis, Riedel's iron-hard struma, benign granuloma of the thyroid (Ewing), or ligneous thyroiditis (Delore), a rare lesion of the thyroid gland. Its etiology is obscure. It is generally considered malignant clinically, but its benign nature is apparent on histologic examination. No recurrence has been reported in the literature. Operative removal is the usual form of treatment. However, it may be well worth while to attempt its removal by radium or roentgen-ray treatment, providing the benignity of the lesion is first established.

Prevention of Acute Intestinal Obstruction. — Horine believes that acute intestinal obstruction might be prevented in a large number of cases by more conservative drainage of the peritoneum. Draining the abdomen through the rectus and midline incision gives the coils of intestine a greater possibility of becoming obstructed, because loops of intestine may encircle the drain tract, besides leaving at times an organized band free in the peritoneal cavity. In lateral drainage, as in the McBurney incision where the drain is placed along the pelvic wall, coils of intestine are less likely to encircle the tubes or drain tract. The upper abdomen can be drained from the side by instituting drainage through the lateral wall. Subphrenic abscesses of either side or subhepatic abscesses can be drained with equal result by this route. Drainage of the lower abdomen is more likely to produce an obstruction because most of the small intestine is situated below the umbilicus, thereby making drainage more difficult.

Jejunostomy for Acute Intestinal Obstruction.—Of the various methods of the surgical treatment of acute mechanical intestinal obstruction, Lee and Downs feel that a high jejunostomy performed with a rubber tube after the technic of a Witzel gastrostomy is the most satisfactory procedure. The procedure should be used, alone or in combination with other procedures, in all cases of acute mechanical intestinal obstruction of over twenty-four hours duration which are submitted to operation. The stoma left on the withdrawal of the rubber tube closes promptly when the need for it has passed. This method when used as a temporary expedient will at times allow an apparently hopeless patient to improve to such an extent that more radical procedures may be attempted later when there is some hope of success.

Gunshot and Stab Wounds of Abdomen.—Twenty cases of gunshot perforations of the abdomen and thirty-two of stab wounds are analyzed by Condict. Of the twenty gunshot wounds there were eleven recoveries and nine deaths, a mortality of 45 per cent., and of the stab wounds there were twenty-three recoveries and nine deaths, a mortality of 28 per cent. The time elapsing from the receipt of injury to the operation varied from one-half to twenty-four hours, with an average of slightly over two hours. The mesentery was perforated four times, the omentum five times and the inferior vena cava once. Omentum was found protruding from the abdomen five times and the intestine three times. Of the wounds of the hollow organs there was one of the gallbladder and common bile duct, ten of the stomach, two of the descend-

ing colon, two of the transverse colon and one of the sigmoid, six of the jejunum and six of the ileum. Of the solid organs there was one perforation of the pancreas, only two perforations of the spleen, three of the kidney and twelve of the liver. In no case, in this series, were the pelvic organs or the bladder involved. In only one instance in the series was a perforation overlooked at operation and found at autopsy and this case was an exceedingly difficult one—inasmuch as five other perforations were found.

Coexistent Nephrolithiasis and Ureterolithiasis.—Fowler reports the case of a young man who suffered attacks of dull pain in the right side and back during several years. Finally a more severe attack occurred, but the vague subjective and objective symptoms and signs did not suggest calculus. The diagnosis was made by urinalysis, roentgenograms and cystoscopy.

Idiopathic Osteopsathyrosis.—A case of idiopathic osteopsathyrosis (fragilitas ossium) occurring in a negro, 38 years of age, is reported by Wagoner. The patient had suffered, as the result of slight trauma, approximately forty-five fractures of the long bones. The calcium and phosphorus content of the blood plasma and the calcium, phosphorus and magnesium content of the bone were normal. The basal metabolic rate was increased; there were marked exophthalmus, palpable thyroid, immature genitalia, shallow pituitary fossa, mild tachycardia, blue sclerae and impaired hearing. No history of syphilis, infection or familial predisposition to bony fracture or disease could be elicited. There was no history of blue sclerae in the members of the immediate or remote family. Microscopic examination of the cross-section of the tibial shaft procured by amputation of the left leg showed a broken and thinned cortex, distended Haversian canals, increased bone resorption and new bone formation.

Archives of Internal Medicine, Chicago

34: 1-135 (July) 1924

*Scapular Types. W. W. Graves, St. Louis.—p. 1.
*Primary Sarcoma of Stomach. H. S. Thatcher, New York.—p. 27.
*Calcification of Heart: Roentgenologic Demonstration. T. Scholz, New York.—p. 32.
*Duodenal Drainage. C. M. Jones, Boston.—p. 60.
*Treatment of Asthma with Autogenous Vaccines. W. S. Thomas and M. D. Touart, New York.—p. 79.
Autogenous Vaccines in Diagnosis; Asthma. W. S. Thomas, L. W. Famulener and M. D. Touart, New York.—p. 85.
*Pellagra. G. D. Head, Minneapolis.—p. 93.
Acute Intestinal Obstruction. I. Types of Obstruction Produced Under Local Anesthesia. R. W. Hausler and W. C. Foster, Portland, Ore.—p. 97.
Experimental Nephritis. F. R. Nuzum and R. Garland, Stanta Barbara, Calif.—p. 108.
Hemoglobin Content of Red Blood Cells in Relation to Surface Area. I. M. Rabinowitch and G. Strean, Montreal.—p. 124.
*Effect of Cholecystectomy on Gastric Secretion. J. Meyer, A. C. Ivy and E. T. McEnery, Chicago.—p. 129.

Scapular Types.—Observations on a certain family, in 1906, led Graves to classify human scapulae into convex, straight and concave types and to designate both the straight and concave types, the scaphoid. Investigations of living, fetal and skeletal (ancient and modern) material and of lower mammalian material revealed the hereditary nature, primal origin, of each scapular type. Comparative clinical and anthropometric studies of members of families through as many generations as possible showed that scapular type inheritance is usually dependent on scapular type matings, and that disease and possibly other poison factors may occasionally "alter" such inheritance. Investigations of comparable groups, representing living, necropsy and skeletal material of known age disclosed a finding as yet unparalleled in mammalian morphology: the age incidence of scapular types, i. e., the convex increases while the straight and concave decrease in frequency of occurrence in successive age periods from birth to old age. The results thus far secured from this study clearly show the usefulness of scapular types in studies of human heredity, longevity, morbidity and adaptability.

Primary Sarcoma of Stomach.—Thatcher's case was one of large spindle cell sarcoma of the stomach, with metastatic sarcoma of the liver.

Calcification of Heart.—Scholz reports a case in which calcium had been deposited in large quantities within the necrosed apical portion of the heart following a gradually complete obliteration of the left coronary artery. The patient was able to carry on a moderately bearable life notwithstanding the fact that a large portion of the left ventricle had been practically put out of commission.

Duodenal Drainage.—The results of duodenal analysis in 274 cases is reported by Jones. In addition to normal controls, 202 pathologic controls have been studied, including twenty-seven different disease entities. Fifty-seven cases of cholelithiasis have also been studied, in forty-two of which the diagnosis was proved by operative findings. In cases of cholelithiasis, characteristic sediments have been found. These findings consist of abnormal amounts of any or all crystalline elements. Bile-stained cellular elements which are interpreted as suggestive of an irritative process in the biliary tract, are also found in a large proportion of these cases. Other types of biliary tract disease, as a rule, also exhibit abnormal cellular or crystalline elements, but with no degree of constancy, and the findings in such cases are suggestive, rather than diagnostic. The results of bile pigment estimations in the cases studied tend to confirm previous investigative findings. The diagnosis and treatment of biliary tract disease by duodenal drainage, on the theory that magnesium sulphate instillations into the duodenum produce gallbladder contractions and subsequent drainage, is criticized on the basis of clinical and experimental observations. Deductions as to the localization of biliary tract pathologic changes on the basis of so-called "A," "B" and "C" biles are similarly criticized. A conservative use of duodenal analysis as a therapeutic and diagnostic measure in carefully selected cases is advocated.

Autogenous Vaccine Therapy of Asthma.—Sixty-two cases of asthma and asthmatic bronchitis, tested and treated with autogenous vaccines, form the basis of this report by Thomas and Touart. Thirty-two are completely relieved of their asthma; fourteen are markedly improved; eight are recent, and eight were failures. Long duration of the asthma did not seem to influence the result unfavorably.

Pellagra: Defective Protein Theory.—The case recorded by Head is said to support the defective protein theory relative to the etiology of the disease, in that the patient had been deprived of meat for about two years prior to the onset of the attack. Prompt recovery ensued on a generous meat diet and the use of sodium cacodylate intravenously. It is the first case to be reported from South Dakota, a supposedly nonpellagrous area.

Effect of Cholecystectomy on Gastric Secretion.—Meyer et al. found that cholecystectomy in dogs prepared by the Pawlow pouch method does not cause a depression of gastric secretion. In three out of four dogs a variable degree of hypersecretion resulted. Bile in 50 c.c. amounts stimulates gastric secretion when given by stomach tube or applied to the intestinal mucosa. It is pointed out that bile, through its rôle in the digestion of fats, may have an indirect excitatory action on the gastric secretory mechanism.

Boston Medical and Surgical Journal

191: 43-90 (July 10) 1924

*Treatment of Scarlet Fever with Dochez's Antiscarlatinal Serum. F. G. Blake, New Haven, Conn.—p. 43.
Relation of Teaching Hospital to Medical School. A. S. Begg, Boston.—p. 47.
Organization of Mental Hospital Staff. W. A. Bryan, Worcester, Mass.—p. 50.
Responsibility of Hospital in Teaching of Surgery. J. E. Briggs, Boston.—p. 53.
Tuberculosis in Children. H. D. Chadwick, Westfield, Mass.—p. 58.
Metabolism in Urticaria Scripta. A. W. Rowe and F. H. McCrudden, Boston.—p. 60.

191: 91-140 (July 17) 1924

Care of Tuberculous in Industry. H. J. Howk, Mount McGregor, N. Y.—p. 91.
Preventorium: Growth and Future. W. A. Griffin, Sharon, Mass.—p. 96.
Active Use of Chest in Pulmonary Tuberculosis. S. Delano, New Britain, Conn.—p. 101.
Acute Appendicitis as Complication of Scarlet Fever: Four Cases. C. L. Thenebe, Hartford, Conn.—p. 112.
Spine Fusion (Hibbs) in Treatment of Vertebral Tuberculosis. R. F. Sullivan, Melrose, Mass.—p. 114.

Dochez Serum for Scarlet Fever.—A clinical and laboratory study made by Blake of Dochez's antiscarlatinal serum has shown that it is a valuable therapeutic agent in the treatment of scarlet fever. Intracutaneous injection of the serum in patients with scarlet fever produces a local blanching of the rash at the site of the injection. Intramuscular injection of the serum in therapeutic doses early in the disease is followed by rapid clinical cure as evidenced by critical fall of temperature and pulse to normal, rapid fading of the exanthem, and prompt return to a state of well being. The specific toxic substance present in the blood of patients with scarlet fever is neutralized in vitro by Dochez's serum. It promptly disappears from the blood following serum treatment. The blood serum of scarlet fever patients acquires the capacity to blanch the rash in scarlet fever within a few hours after serum treatment. The serum has now been used in twenty-six cases with prompt cure in all but one case. Not only has the serum been effective in early uncomplicated cases, but also in cases with septic complications.

Canadian Medical Association Journal, Montreal

14: 573-670 (July) 1924

*Lung Percussion. J. R. Byers.—p. 580.
Concentration Method of Sputum Examination. P. M. Andrus.—p. 581.
Radiographic Findings Diagnostic of Pulmonary Tuberculosis. J. S. Pritchard.—p. 583.
Physical and Roentgen-Ray Examination of Exservice Men. A. F. Miller.—p. 585.
Symptoms of Upper Respiratory Tract Disease Simulating Tuberculosis. R. S. Pentecost.—p. 591.
Septic Conditions of Chest. W. L. Mann.—p. 593.
Differentiation and Treatment of Lung Abscess. R. G. Fergusnn.—p. 597.
Nontuberculous Pulmonary Diseases. B. H. Hopkins.—p. 603.
Syphilis of Lung. F. W. Blakeman.—p. 606.
*Overdiagnosis of Pulmonary Tuberculosis. A. D. Adamson.—p. 610.
*Disordered Heart Action and Development of Tuberculosis. A. T. Bond. —p. 613.
*Clinical and Experimental Use of Dreyer's Tuberculo-Antigen. A. H. W. Caulfeild.—p. 616.
Complications Met in Sanatorium Practice. A. H. Baker.—p. 619.
Neurasthenic Reaction. W. T. B. Mitchell.—p. 623.
*Case of Addison's Disease Treated by Suprarenal Transplant. M. Currie.—p. 626.
Bullet Wound of Abdomen, Liver and Lung; Recovery. S. H. Corrigan. —p. 628.
Smallpox Epidemic. R. K. Dewar.—p. 629.

Lung Percussion.—The method of percussion used by Byers consists essentially in establishing a basic note of resonance in one lung with which all other notes in any other part of that lung can be compared. With the patient preferably in a sitting position on a revolving stool he percusses over the whole lung with extremely light strokes against the distal phalanx of the pleximeter finger until he finds the most resonant note. This is the basic note. This point is marked with a pencil. Holding the pleximeter finger on the line of a radius and percussing very lightly, he proceeds in short advances, using one stroke to each move. At the first rise in pitch that the ear detects, a short line is drawn on the skin at a right angle to the radius. Having completed the first radius, a second is dealt with in a similar manner, and so on throughout the set. When all the radii have been completed, it will be found on the joining of all the short markings that there is a definite line established, and that one has a tonal contour of the basic note of the lung reasonance.

Overdiagnosis of Pulmonary Tuberculosis.—Slight variations from what are conceived to be normal physicial findings unsupported by posttussic crepitations, or roentgen-ray shadows in the lung parenchyma, Adamson says, are insufficient evidence of pulmonary tuberculosis even in the presence of general symptoms of debility and cough. Occult tuberculosis, sublimal tuberculosis and peribronchial tuberculosis are not sufficiently proved to warrant their use as final diagnoses. The presence or absence of localized, peripheral, parenchymatous shadows, in well taken roentgen-ray films, is by far the most important point in making or breaking a diagnosis of early pulmonary tuberculosis.

Disordered Heart Action and Tuberculosis.—From a review of 500 persons suffering from disordered heart action, it appears to Bond that tuberculosis among disordered heat action pensioners is not unduly common, nor in undue proportion to other common conditions; the finding of minimal lesions several years after a discovery of disordered heart action is not a sufficient explanation of the effort syndrome, nor does it justify the conclusion that the original diagnosis was in error; the more remote the disordered heart action, the less likely the association.

Dreyer's Tuberculo-Antigen.—This antigen has been tried by Caulfeild in three directions: namely, experimentally with guinea-pigs, as an antigen in the routine serial testing of tuberculous serum for complement fixation, and therapeutically with both pulmonary and nonpulmonary forms of tuberculosis. This is merely a preliminary report and conclusions cannot be drawn. In the clinical trials made by thirteen physicians in about 150 cases, in none, or few, was the result regarded as necessarily due to the use of the antigen.

Suprarenal Transplant in Addison's Disease.—In this case Currie transplanted the suprarenal gland of a sheep into an abdominal incision going down to the deep fascia. Later it appeared as if the transplant would not be a success. There was a discharge from one end of the incision; the patient suffered from nausea, diarrhea and cardiac distress. Notwithstanding the failure of the transplant it seemed that there had been some slight improvement for a few days as the result of its presence. Then both suprarenals of a sheep were transplanted. The glands were cut into fine strips and dropped into salt solution. The resulting tissue was skimmed out of the salt solution with a sterile spoon and dropped into the barrel of a 10 c.c. syringe. The needle was inserted deeply into the subcutaneous tissue on one side of the abdomen and about half the tissue was forced out as the needle was gradually withdrawn. The operation was repeated on the other side of the abdomen; altogether about 5 c.c. of gland and salt solution were injected. Three months afterward the patient is said to have been greatly improved.

Illinois Medical Journal, Oak Park

46: 1-76 (July) 1924

Reregistration vs. Rational Method of Dealing with Cult Problem. E. M. Stanton, Schenectady, N. Y.—p. 6.
Medical Preparedness in Time of Peace. M. W. Ireland, Washington, D. C.—p. 32.
Christian Fenger's Work in Chicago. W. Van Hook, Chicago.—p. 36.
Mesenteric Thrombosis. O. L. Pelton, Elgin.—p. 39.
Toxemias of Pregnancy. G. J. Hagens, Chicago.—p. 42.
Amebic Abscess of Liver: Case. T. H. Kelley, Chicago.—p. 46.
Effects of Early Marriages. C. L. Redfield, Chicago.—p. 51.
Lumbar Puncture Technic. H. E. Irish, Chicago.—p. 54.
Hematuria; Pathogenesis. J. S. Eisenstaedt, Chicago.—p. 56.
Visual Disturbance and Social Worker. C. Loeb, Chicago.—p. 60.
Leadership in Modern Age. C. R. Carlin, Alton.—p. 65.
Systemic Pharyngitis. B. Lemchen, Chicago.—p. 70.
Drug Addicts. C. E. Sceleth, Chicago.—p. 70.

Iowa State Medical Society Journal, Des Moines

14: 285-346 (July) 1924

Life Insurance Examinations. M. I. Olsen, Des Moines.—p. 287.
Tuberculosis of Kidney. A. A. Schultz, Ft. Dodge.—p. 294.
Malignancy of Tongue; Case. I. N. Crow, Fairfield.—p. 300.
Differentiation Between Quick and Dead. G. W. Crile, Cleveland.—p. 305.
Management of Maternity. W. D. Chapman, Silvis, Ill.—p. 309.
Ophthalmologist, Roentgenologist and Serologist Indispensable to Syphilologist. R. E. Jameson, Davenport.—p. 311.
Chorio-Epithelioma from Hydatid Mole. Two Cases. G. T. McCauliff, Webster City.—p. 313.

Johns Hopkins Hospital Bulletin, Baltimore

35: 197-228 (July) 1924

*Influence of Intravenous Sodium Chlorid on Intestinal Absorption and Peristalsis. W. Hughson and J. E. Scarff, Baltimore.—p. 197.
*Glycerin as Antiketogenic Substance in Diet of Diabetic Patients. H. M. Thomas, Jr., Baltimore.—p. 201.
*Study of Lymph Pressure. C. S. Beck, Boston.—p. 206.
*Clinical Study of Hypernephroma. M. Cutler, Baltimore.—p. 214.
*Opaque Mass for Roentgenology. E. C. Hill, Baltimore.—p. 218.
*Blood Grouping. V. Recognition of Three Types of Group II Blood. C. G. Guthrie, J. F. Pessel and J. G. Huck, Lawrenceville, N. J.—p. 221.

Effect of Hypertonic Salt Solution on Intestinal Absorption.—Hughson and Scarff report their observations on the effect of the intravenous injections of hypertonic salt solution in relation to intestinal absorption. Intravenous injection of a 30 per cent. sodium chlorid solution decreased the absorption

rate of water from an isolated loop of duodenum and jejunum in cats. The injection of this hypertonic solution furthermore caused active peristalsis, not only of the normal intestine, but of loops of bowel which had been subjected to various experimental procedures designed to imitate paresis. This holds true so long as the blood supply remains intact.

Antiketogenic Diet in Diabetes.—From Thomas' experience glycerin would appear to be a valuable agent for increasing the antiketogenic content of the diet, thereby producing an increase in the amount of fully catabolized fat, while at the same time the carbohydrate content of the diet can be kept at a relatively low level. Its sphere of usefulness as a daily component of diabetic diets is limited to those cases in which the carbohydrate tolerance is slightly lower than that necessary to permit of a "maintenance diet," that is, of a diet that will prevent loss of weight when the patient resumes the daily routine of life and moderate work.

Lymph Pressure.—The forces responsible for the production of pressure in the lymph system are: (1) the pressure in the lymph capillaries as determined by the physical processes of osmosis, filtration and diffusion and as modified by changes in the permeability of the capillary wall; (2) changes in the external pressure on the lymph system; (3) the contractility of the lymph capillaries and the lymph vessels. According to Beck's observations the average pressure in dogs produced by the flow of lymph from the thoracic duct into the isolated venous cistern, during ether anesthesia, is 190 mm. expressed in terms of lymph, the highest pressure being 420 mm. and the lowest pressure being 42 mm. The lymph pressure is influenced readily by pressures applied from without the lymphatic system, such as pressure on the abdomen or marked changes in the intrathoracic pressure. Lymphagogues, when injected into the blood stream, are followed by a rise in the lymph pressure. Such substances are sodium chlorid, dextrose, histamin, epinephrin and peptone. Hypertonic, hypotonic and isotonic salt solutions administered intramuscularly or intraabdominally have no effect on the lymph pressure; when injected into the blood stream, hypertonic salt solution is followed by a marked rise, and isotonic salt solution by a slight rise, while hypotonic salt solution has no effect, nor does ligation of the portal vein. Bleeding is followed by a slight fall.

Hypernephroma.—During the past sixteen years, thirty-two cases of hypernephroma came to operation in various services of the Johns Hopkins Hospital. Cutler analyzes these cases. Nephrectomy was performed in all of them. Recent pathologic studies have demonstrated that a large proportion of the reported hypernephromas are in reality renal adenocarcinomas. Sixty-two per cent. of the cases occurred between the ages of 40 and 60. Each kidney was involved with equal frequency. Injury was mentioned as a possible inciting factor in 10 per cent. of the cases. The average duration of symptoms from the time of appearance of the initial symptom to the time of operation was three and one-half years. Hematuria was by far the commonest symptom. Gross hematuria occurred in 81 per cent. of the cases; microscopic hematuria in 94 per cent. Hematuria was the initial symptom in 68 per cent. of the cases. The initial hematuria commonly followed some form of overexertion; it was usually profuse, intermittent and irregular. Pain, which was the second commonest symptom, was present in 91 per cent. of the cases; renal colic in 66⅔ per cent.; dysuria and urinary retention in 25 per cent., and frequency of urination in only 12 per cent. A tumor was palpated on physical examination in 80 per cent. of the cases. Constitutional symptoms, consisting of weakness, general malaise, dyspnea, and loss of weight, were present in 60 per cent. Of all the patients operated on, two failed to survive the operation, and four more died in the hospital. Four are known to have died since leaving the hospital at intervals varying between one and three years. Eight are known to be living at intervals of eight months to nine years, and fourteen could not be traced.

Opaque Mass for Roentgenology.—An injection mass made up of from 15 to 18 gm. bismuth oxychlorid (prepared for roentgen-ray work), from 5 to 10 gm. acacia and water sufficient to bring the quantity up to 100 c.c. has proved of value to Hill in studying the circulation. By repeated semifilterings the mass may be reduced to a suspension of bismuth containing particles of from 4 to 8 microns and thus pass through capillaries.

Blood Group II.—Guthrie, Pessel and Huck assert that there are at least three distinct types of blood included in Group II. From the results of cross agglutination and absorption tests, they assign to these three types the following formulae: A-bc; AD-bc; AD-b.

Journal of Medical Research, Boston

44: 383-488 (June) 1924

Kurloff Bodies in Blood of Guinea-Pigs. L. Bender, Chicago.—p. 383.
Congenital Cystic Omenta, Kidneys and Livers in Identical Guinea-Pig Twins. A. W. Meyer, Stanford University, Calif.—p. 401.
Case of Malignant Endothelioma; Necropsy. N. C. Foot, Cincinnati.—p. 417.
Influence of Roentgen Ray on Experimental Syphilis in Rabbit. G. S. Graham, W. M. Baldwin and W. K. Grigg, Albany, N. Y.—p. 431.
Effect of Heat and Cold on Amebocyte Tissue of Limulus. L. Loeb and D. Drake, St. Louis.—p. 447.
Studies on Hypertension: Relation of Age to Size of Heart. E. T. Bell and T. B. Hartzell, Minneapolis.—p. 473.

Medical Journal and Record, New York

120: 53-100 (July) 1924

Social Significance of Medicine. L. F. Barker, Baltimore.—p. 53.
Operation for Inguinal Hernia. E. Andrews, Chicago.—p. 57.
*Kidney Function in Osteitis Deformans: Case. F. J. Scully, Hot Springs, Ark.—p. 62.
Phlebitis and Thrombophlebitis Migrans. J. Harkavy, New York.—p. 64.
Nonsurgical Biliary Drainage. M. Golob, New York.—p. 69.
Procedure for Relief of Ala Deformity in Cases in Adult Associated with Hare Lip. J. E. Sheehan, New York.—p. 72.
*Hydatid Brain Cyst. J. W. Shuman, Los Angeles.—p. 73.
Value of Bacterins in Practice. E. C. Laverty, Louisville, Ky.—p. 74.

SUPPLEMENT

Cancer of Colon. E. G. Slesinger, London.—p. xvii.
Metastasis from Symptomless Cancer in Esophagus. G. B. New and P. P. Vinson, Rochester, Minn.—p. xix.
Diagnosis of Spinal Metastases with Primary Focus in Chest. T. Scholz, New York.—p. xx.
Unusual Massive Tumor of Abdomen. J. Friedenwald and W. A. Fisher, Baltimore.—p. xxv.
Ligature Treatment of New Growths. A. H. May, Buffalo.—p. xxvii.
Cancer of Hepatic Flexure of Colon. J. Peutot, Lyons, France.—p. xxviii.

Kidney Function in Osteitis Deformans.—In the case cited by Scully, laboratory examination of the urine showed a heavy trace of albumin and many hyaline casts. The volume for twenty-four hours was 960 c.c., the specific gravity 1.016 and the reaction acid. A kidney function test showed an excretion of 10 per cent. of phenolsulphonephthalein in two hours on one observation and 15 per cent. on a second observation. Chemical examination of the blood, November 10, gave 26.5 mg. of urea, 2.8 mg. of uric acid, 56 mg. of nonprotein nitrogen and 1.4 mg. of creatinin per hundred cubic centimeters. November 25, the tests showed 4.0 mg. of uric acid and 1.02 mg. of creatinin, and on December 12, 15.5 mg. of urea, 4.5 mg. of uric acid, 46.2 mg. of nonprotein nitrogen and 1.8 mg. of creatinin per hundred cubic centimeters. A blood count showed 90 per cent. hemoglobin, 5,120,000 red cells and 7,000 white cells. The Wassermann test was negative.

Hydatid Brain Cyst.—Shuman's case was one of hydatid cyst within the medulla of the brain, encroaching on the cortex only in the right quadrate lobule. Death was due to intracranial pressure.

Missouri State Medical Association Journal, St. Louis

21: 209-256 (July) 1924

Victories of Medicine. G. W. Robinson, Kansas City.—p. 209.
Future of Medicine. F. C. Warnshuis, Grand Rapids.—p. 214.
Studies of Disorders of Ductless Glands. W. Engelbach, St. Louis.—p. 217.

Southwestern Medicine, Phoenix, Ariz.

8: 305-356 (July) 1924

Medical Education of Public. J. W. Stofer, Gallup, N. M.—p. 305.
Renal Syphilis; Case. E. B. Rogers, El Paso.—p. 309.
Acute Infectious Jaundice; Eleven Cases. R. E. Thomas, Los Angeles.—p. 314.

Chronic Infectious Endocarditis. Two Cases. C. S. Kibler, Tucson.—p. 318.
Insulin in Diabetes. B. Smith, Los Angeles.—p. 324.
Basal Metabolism. P. B. Newcomb, Tucson.—p. 327.
Fractured Collar Bones and Thighs Without Deformity. C. W. Hawley, Chicago.—p. 331.
Maxillary Sinusitis. Four Cases. M. C. Comer, Tucson.—p. 333.

Wisconsin Medical Journal, Milwaukee

23: 69-122 (July) 1924

Cautery Treatment of Chronic Gonorrhea in Female. H. W. Shutter, Milwaukee.—p. 69.
Ureteral Obstruction. W. E. Bannen, La Crosse.—p. 71.
Obstructing Stricture of Male Urethra. J. C. Sargent, Milwaukee.—p. 75.
Lower Urinary Tract Infections. E. F. Mielke, Appleton.—p. 78.
Benign Hypertrophy of Prostate. I. R. Sisk, Madison.—p. 82.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

5: 123-198 (June) 1924

*Pathogenicity of Bacillus Coli. T. H. C. Benians.—p. 123.
Glycogenic Function of Liver; Endocrine Control. W. Cramer.—p. 128.
*Bacterial Factor in Dental Caries. J. K. Clarke.—p. 141.
Fluid Measurements with Capillary Pipet. A. Fleming.—p. 148.
*Silica in Determining Bacillus Tuberculosis Infections. E. H. Kettle.—p. 158.
*Effect of Vaccines on Lysozyme Content of Tissues and Secretions. V. D. Allison.—p. 165.
*Group Specificity of Antigens Derived from Acid-Fast Bacilli. C. C. Twort, E. W. Todd and R. J. Perkins.—p. 171.
*Etiology of Dental Caries. J. McIntosh, W. W. James and P. Lazarus-Barlow.—p. 175.
II. Bacillus Acidophilus Odontolyticus.
III. Production of Artificial Caries.
Immunzing Properties of Bacterial Antigens. N. S. Ferry and L. W. Fisher.—p. 185.

Pathogenicity of Bacillus Coli.—Evidence is presented by Benians which shows that if gum is put into the peritoneum and *Bacillus coli* into the blood stream the bacilli will infect the peritoneum, although not in sufficient numbers to set up an acute disease. In the immunized animal the peritoneum is quickly sterilized even if large numbers of living bacteria are present in gum. In such animals the bacteria survive a far shorter time in the blood stream than in normal animals, but no increased bactericidal power of the serum was demonstrated in vitro. The presence of bile in the blood stream with living bacteria leads to a rapid invasion of gum in the peritoneum and a fatal infection in the nonimmunized animal, but previously inoculated animals survive it easily. In certain circumstances *B. coli* in the peritoneum may be immensely pathogenic. The advantage of a preliminary immunization with *B. coli* as a protection against infection with this organism is demonstrated.

Bacterial Factor in Dental Caries.—The evidence presented by Clarke suggests that caries is due to infection of the teeth, in certain circumstances not yet made clear, by a hitherto undescribed streptococcus, *Streptococcus mutans*. Whether the primary infection is facilitated by defective structure of the teeth remains to be proved.

Silica Determines Site of Tuberculosis Infections.—Kettle states that tubercle bacilli injected into the circulation of rabbits and mice tend to settle in localized subcutaneous lesions produced by various agents which bring increased vascularity and tissue necrosis. When silica is the provocative agent, the determination of the organisms to the inflammatory focus is invariable, and the bacilli proliferate extensively in such lesions. Inasmuch as similar results are not obtained with other provocative agents, silica appears to have some specific action on the growth of the tubercle bacillus in the tissues.

Effect of Vaccines on Lysozyme.—Allison asserts that the lysozyme content of the tissues or tissue fluids of man and animals cannot be increased by active immunization.

Defatted Antigens in Complement Fixation Test.—For the diagnosis of human tuberculosis by the complement fixation test, it appears from a small number of reactions carried out by Twort et el. that the defatted antigens of *Bacillus phlei* or *B. tuberculosis* are markedly superior to the whole bacilli; the same applies to animals' serums the titers of which are very low. In tuberculous guinea-pigs no appreciable beneficial effect has been noted by the use of defatted *B. phlei* vaccines.

Etiology of Dental Caries.—McIntosh, James and Lazarus-Barlow discuss further the relationships of *Bacillus acidophilus-odontolyticus* to dental caries, its distribution in nature and the production of experimental caries. The frequent occurrence of this bacillus in milk suggests this medium as an important source of infection. Experiments to produce caries artificially in rabbits have failed. There is slight evidence of success in the case of a monkey.

British Journal of Ophthalmology, London

8: 257-304 (June) 1924

Influence of Calcium Chlorid on Production of Ocular Fluid and on Ocular Pressure. G. F. Rochat and J. S. Steyn.—p. 257.
Arabic Bronze Needle from Antiquity for Depression of Cataract. S. Holth.—p. 266.
Improved Punch Forceps for Tangential and Extralimbal Sclerectomy in Chronic Glaucoma. S. Holth.—p. 269.
Surgical Method of Dealing with Keratoconus. G. Young.—p. 270.
Operation of Congenital Ptosis. G. Young.—p. 272.
Case of Ectopia Lentis with Coloboma. D. V. Giri.—p. 275.
Case of Congenital Miosis. T. H. Cresswell.—p. 278.
Eye and Photographic Lenses. V. C. Verbitzky.—p. 280.

British Medical Journal, London

1: 1119-1162 (June 28) 1924

*Changing Standpoints in Metabolic Diseases: Diabetes, Nephritis, Jaundice. W. L. Brown.—p. 1119.
*Plea for Clinical Physiology. J. Mackenzie.—p. 1122.
Action of Quinin on Protein Metabolism, Respiratory Exchange and Heat Function. S. W. Hardikar.—p. 1125.
*Tuberculoma of Pituitary. T. W. Letchworth.—p. 1127.
Temperature and Saturation of Exhaled Air in Relation to Catarrhal Infections. P. Tozer and L. Hill.—p. 1127.
*Myoclonic Encephalitis Treated by Patient's Spinal Fluid. R. W. Power.—p. 1129.
Recurrent Intussusception. J. H. Clarke.—p. 1129.
Roentgen Rays in Lupus of Nasal Mucous Membrane. H. Flecker.—p. 1129.
Angina Pectoris: Death from Coronary Embolism. C. Helm.—p. 1129.

Acidemia and Alkalemia Cause Dyspnea.—Brown sums up his paper as follows: When acidemia is associated with dyspnea, the acidemia is the cause of the breathlessness; when alkalemia and dyspnea are associated, the alkalemia is the result of the dyspnea. Recognition of these facts is of great importance in selecting the appropriative measures of treatment.

Importance of Clinical Physiology.—If experimental physiology is to benefit suffering humanity, Mackenzie says that a supplementary physiology dealing with the normal activities and those produced by disease must be employed, and experiment should be guided by the needs of the clinical observer. To a physiologist who is also a clinical observer, the kind of experiment that is required is bound to be much clearer than the somewhat blind endeavors that have characterized the attempts to solve clinical problems in the past. If the kind of physiology which clinical observation can reveal be not acquired, most of the enterprises which are concerned in the solution of the problems of disease will result in failure, or achieve a measure of success not in proportion to the time and energy spent. The knowledge of physiology obtained in this way is limited to explaining the derangements which result in ill health, and cannot of itself solve the problems of disease, but it is an essential adjunct. Until it is acquired, the work of the bacteriologist, of the pharmacologist, of the biochemist, as well as of the clinician, will fall far short of attaining the objects of their endeavor.

Tuberculoma of Pituitary.—The only localizing symptoms in Letchworth's case were loss of sight and extreme polyuria.

Myoclonic Encephalitis Treated by Patient's Spinal Fluid.—Power's patient had myoclonic spasms of the abdominal muscles—about seventy to the minute. Daily lumbar puncture gave no relief. On the fifth day 10 c.c. of the spinal fluid withdrawn was injected intravenously. Temporary relief followed. Twenty-four hours later this procedure was repeated. Permanent relief from pain and spasms resulted.

Indian Journal of Medicine, Calcutta

4: 177-220 (December) 1923

Neurosyphilis. S. C. Sen Gupta.—p. 177.
Cancer Problem. K. K. Chatterji.—p. 193.
Antiprotozoal Properties of Emetin Hydrochlorid. K. K. Chatterji.—p. 198.
Treatment of Kala-Azar. N. N. Ghosh.—p. 201.
Extraction of Foreign Bodies from Ear with Cystotome. R. Prasad.—p. 206.

Indian Medical Record, Calcutta

43: 161-192 (June) 1924

Case of Raynaud's Disease. S. L. Sarkar and S. N. Maitra.—p. 161.
Medicolegal Responsibilities in Cases of Poisoning. T. P. Chatterji.—p. 163.
Protein Sensitization and Desensitization. A. Ray.—p. 166.
Minor Endocrine Glands: Testis. S. K. Mukherji.—p. 175.

Irish Journal of Medical Science, Dublin

5: 245-292 (June) 1924

Coombe Hospital (Maternity) Report, 1923. L. Cassidy, T. M. Healy and J. N. Hodgeman.—p. 245.

Journal of Biochemistry, Tokyo

3: 283-474 (April) 1924

Absorption of Ammonia by Soils. K. Miyake, M. Sugawara and K. Nakamura.—p. 283.
Nature of Acidity After Addition of Soybean Cake to Rice Field. K. Miyake and I. Tamachi.—p. 305.
Effect of Various Substances on Erythrocytes. S. Kikuchi.—p. 325.
Gliadin. I. Eto.—p. 373.
Physicochemical Properties of Phospholipin. II. Effect of Albumin on Physicochemical Properties of Lecithin. N. Fujii.—p. 393.
*Normal Value of Sugar Excretion Threshold. M. Nakayama.—p. 407.
*Effect of Salt and Globulin on Agglutination Phenomenon. T. Shionoya.—p. 423.
*Effect of Albumin-Fat Diet on Carbohydrate Metabolism. N. Kageura.—p. 457.
Effect of Salt Solution on Erythrocytes in Blood. J. Umezawa.—p. 461.

Blood Sugar Curves in Fasting Nondiabetics.—Nakayama made blood sugar determinations on 202 nondiabetics who were fasting. The percentage varied from 0.06 to 0.12, with an average of 0.088 per cent.

Effect of Globulin on Agglutination Phenomenon.—Shionoya asserts that following on the injection of epinephrin and pilocarpin in nonsyphilitics, a reaction not unlike the Wassermann reaction is obtained. It is based on an increase of blood serum globulin. Therefore, the Wassermann test should not be performed after certain medicinal agents have been administered.

Effect of Albumin-Fat Diet on Carbohydrate Metabolism.—Kageura's experiments show that the diminished glycogen formation in the liver of animals on an albumin-fat diet is largely the result of a lowered liver function and not of an altered blood content.

Journal of Tropical Medicine and Hygiene, London

27: 175-186 (June 16) 1924

*Mosquito Protection of Water Tanks. A. E. Horn.—p. 175.

Mosquito Protection of Water Tanks.—The apparatus used by Horn consists of a thin metal plate, roughly 11 inches by 8 inches, with an opening in it about 6 by 5 inches. On the under surface a flange is welded around this opening, 1 inch deep at one end, with sides opening to 2 inches at the opposite end. Impinging against the under surface of this flange, and fitting accurately in apposition with it when closed, is a flat metal plate, which is hinged to a wire rod immediately behind the shallow end of the flange, and with a small counterbalancing weight just sufficiently heavy to keep it comfortably apposed to the flange when at rest. The opening in the upper plate is guarded by a few crossed wires to prevent birds, lizards, etc., from falling unwillingly through the trap-door into the water receptacle. The whole apparatus is galvanized and so rendered rust proof. It is fixed by screws through its upper surface to the inlet in the top of the water thank or cask, and receives the rain water coming through the down pipe. While at rest it remains completely closed by the counterbalancing weight and prevents the access of mosquitoes to the enclosed water. With water falling on it the trap swings open to allow a passage, and automatically closes when the fall ceases. It accommodates itself equally to a heavy rush of water or a lighter fall, and although mosquito eggs may be washed from a defective roof gutter through the trap into the tank, it does not allow egress of the adult mosquito, even while opened by the passage of water through it.

Lancet, London

2: 1-52 (July 5) 1924

*Migraine. A. F. Hurst.—p. 1.
*Therapeutic Uses of High Carbohydrate Diets. T. I. Bennett.—p. 6.
Splanchnic Analgesia. O. S. Hillman.—p. 9.
*Flocculation and Complement Fixation in Syphilis. E. W. Todd.—p. 12.
Diagnosis and Treatment of Diabetes Mellitus in Hospital and General Practice. E. G. B. Calvert.—p. 14.
Hepatic Abscess as Complication of Appendicitis. E. G. Slesinger.—p. 19.
Case of Primary Carcinoma of Liver. E. W. Johnson.—p. 19.

Eyestrain as Cause of Migraine.—Hurst stresses the point that the most important part of treatment of migraine is the prevention of eyestrain. He urges practitioners, physicians and oculists, whose past experience has led them to doubt the truth of this statement, to put it to the test once more. He asserts that he has never yet seen a case in which eyestrain was not present, and has only seen two in which its correction did not either cure the patient or lead to very considerable improvement. He says that the reason the importance of the ocular factor is not more widely accepted is that few oculists trouble to give the attention to a patient with migraine that he requires. It is no doubt easy to correct an ordinary case of myopia, hypermetropia, or even astigmatism at a single interview of fifteen to thirty minutes. But it is quite impossible to do this for a patient with migraine, as the smallest errors of refraction and every disturbance in muscle balance require correction with absolute accuracy. This cannot be done in a hurry. At least three examinations on different days are required, the second being with the aid of a cycloplegic, and the third, seventy-two hours later, when the effect of the drug has completely disappeared. The effect of preventing ocular strain is generally felt at once. In many cases, attacks which had occurred at frequent intervals for many years, cease immediately—never to return. In other cases they disappear less dramatically, but none the less surely; the intervals between them become more prolonged and they become less severe in character. Occasionally they actually become more intense and frequent for a short period, as with severe errors of refraction and disturbances in binocular muscle balance it may take some time for the patient to become accustomed to the new conditions and for the strained extrinsic and intrinsic muscles of the eyes to relax. It is then often necessary to begin with a partial correction, and only gradually increase it until it is complete.

Use of High Carbohydrate Diets.—A classification is given by Bennett which includes many of the indications for high carbohydrate diets: (1) certain specific infections: (*a*) pneumococcal pneumonia, (*b*) typhoid and paratyphoid infections, (*c*) *Bacillus coli-communis* infections; (2) certain infections of unknown origin; (3) diseases of the heart and blood vessels; (4) respiratory diseases, which are seldom indications for this diet; (5) diseases of the alimentary system, such as peptic ulcer, undernutrition and disorders of the liver; (6) diseases of the renal system. Of foods, the most useful group is that which is known in France as Pâtes—substances prepared from flour, arrowroot, sago and other starchy substances. In chronic cases fresh fruit is often invaluable.

Flocculation and Complement Fixation in Syphilis.—Todd presents evidence that the sigma reaction is more delicate than the Wassermann reaction in well treated cases of syphilis and in imperfectly treated cases of long standing, but it appears that reliance solely on either method may lead to a very small proportion of positive serums being missed. In the case of cerebrospinal fluids the sigma reaction appears to have little advantage over the Wassermann reaction owing to the fact that in the latter reaction a much larger quantity of cerebrospinal fluid than of serum can be used, whereas in the sigma reaction the quantities are the same. From the limited number of primary cases examined it appears that the sigma reaction usually becomes positive before the Wassermann reaction, but occasionally a positive Wassermann reaction is obtained first.

Annales de l'Institut Pasteur, Paris

38: 449-528 (June) 1924

Functional Mutation in Mouse. G. Bertrand and B. Benzon.—p. 449.
Filtrability of Tubercle Bacillus. J. Valtis.—p. 453.
*Treatment of Trypanosomiasis. Blanchard and J. Laigret.—p. 460.
Blood Parasites in Italian Birds. G. Franchini.—p. 470.
Preservation of Microbes. C. Truche.—p. 516.
Rapid Method for Negri Bodies. S. Andriani.—p. 520.
*Epidemic Spirochetosis in Dogs. J. Lukes (Brno).—p. 523.

Treatment of Trypanosomiasis.—Blanchard and Laigret treat trypanosomiasis in its first stage with six subcutaneous injections of atoxyl at two week intervals, giving 0.02 gm. per kilogram of body weight. The results were excellent, especially with regard to the permanent removal of trypanosomes from the circulating blood. Intravenous injections of tartar emetic between the atoxyl treatment aided the results. Less intensive—so-called prophylactic treatment—does not help in the first stage, and is dangerous in the second (over 50 cells per c.mm. of spinal fluid).

Epidemic Spirochetosis in Dogs.—Lukes investigated an epidemic of ulcerative stomatitis and hemorrhagic gastro-enteritis in dogs. He found spirochetes in the kidneys of a large majority of these dogs. The disease may be transmitted to guinea-pigs. The germs, which he calls *Spirochaeta melanogenes-canis*, grew in serum. The disease may belong to the group of infectious jaundice.

Archives de Médecine des Enfants, Paris

27: 321-384 (June) 1924

Congenital Stenosis of Duodenum. M. Péhu and A. Auberge.—p. 321.
Conc'n, p. 398.
Edema of New-Born. P. Gautier.—p. 342.
Congenital Obliteration of Esophagus. A. Vaz.—p. 347.
Tay-Sachs' Disease. J. Comby.—p. 349.

27: 385-448 (July) 1924

*Hospital Epidemic of Scarlet Fever. Renault and Kourilsky.—p. 385.

Hospital Epidemic of Scarlet Fever.—Renault and Kourilsky describe an epidemic of scarlet fever in a children's hospital. The infection spread rapidly in the common wards. The disease was not transmitted in the wards which were provided with cubicles.

Comptes Rendus de la Société de Biologie, Paris

91: 141-236 (June 27) 1924. Partial Index

*Botulinus Anatoxin. M. Weinberg and P. Goy.—p. 148.
*Chloroform and Epinephrin. E. Bardier and A. Stillmunkès.—p. 157.
*Hypercholesterolemia with Suprarenal Tumor. R. Yovanovitch.—p. 158.
*Treatment of Bilharziasis. M. Petzetakis.—p. 159.
*Induced Lymphocytosis in Cancer Cases. Loeper and Turpin.—p. 164.
*Allergy in Diphtheria. C. Zoeller.—p. 165.
Nocturnal Visual Acuity in Man. J. Beyne and G. Worms.—p. 178.
*Blood Calcium in the Tuberculous. A. Looft.—p. 190.
*Low Blood Calcium with Diarrhea. L. Blum and A. Looft.—p. 194.
Idem in Various Pathologic Conditions. Tschiembes.—p. 195.
*Perlingual Application of Insulin. L. Blum.—p. 199.
*Blood Pressure in Operations. R. Simon and R. Fontaine.—p. 201.
*Scurvy and Tuberculosis. G. Mouriquand et al.—p. 205.
Action on Anaphylaxis of Absence of Vitamin C. M. Zoloz.—p. 215.
*Congenital Malaria. L. de Castro Freire.—p. 219.
*The Schick Reaction. F. d'Assis Brito Filho.—p. 230.
Alleged Antagonism of Gonads. M. Athias.—p. 232.

Botulism Anatoxin.—Weinberg and Goy's experiments showed that immunization of animals is easily induced through injection of botulism antitoxin long acted on by formaldehyd solution. The immunity is pronounced; the blood serum flocculates in presence of a corresponding toxin, and the antitoxic power is high. But the action of the formaldehyd decreases the duration of the immunity.

Mutual Action of Chloroform and Epinephrin.—Bardier and Stillmunkès recall that an intravenous injection of epinephrin causes syncope in a dog under chloroform. Shock from hemorrhage prevents the syncope. The syncope is evidently of toxic origin, due to the reenforcing of the toxicity of the chloroform by the epinephrin. A normal functioning of the nervous system of the heart and the vessels seems to be indispensable for the occurrence of the syncope.

Suprarenals as Factor in High Cholesterolemia.—Yovanovitch's research on a suprarenal adenoma has confirmed the opinion that the suprarenal cortex controls the cholesterol content of the blood. He compares the amount of cholesterol in the adenoma in which a hyperfunctioning of glandular tissue was manifest (25.80 to 164 gm. per 1,000 gm.), with the amount in the surrounding, nonhyperplastic tissue (12.93 to 52.50 gm. in 1,000 gm.). The cholesterol is not deposited in the suprarenal tissue, but is produced by its cells and parallels their function.

Bilharziasis Treatment by Calcium Chlorid.—Petzetakis injects from 0.5 to 1 gm. of a 10 per cent. solution of calcium chlorid, at first every day, then every second day, to a total of twenty injections. He had excellent results in recent cases with slight cystitis, and living ova in the urine, but was less successful in advanced cases.

Influence of Lymphopoiesis on Sarcoma.—Loeper and Turpin implanted in rats grafts of mouse carcinoma and mouse testes to produce lymphocytosis. The lymphocytosis did not seem to exert any protective action against cancer invasion.

Diphtheria-Anatoxin Test.—Zoeller calls attention to the fact that tests with Ramon's diphtheria anatoxin may be positive in cases in which the Schick test is negative, and inversely. A positive anatoxin reaction is a phase between the extremes of virgin soil and total immunity.

Calcemia in Pulmonary Tuberculosis.—Looft declares that, contrary to the prevalent opinion, there is no reduction of calcium in the blood of the tuberculous, except in those with diarrhea. His research showed that in benign or moderately grave cases the amount of calcium is above the normal standard. In grave conditions it is usually normal.

Hypocalcemia in Diarrhea.—Blum and Looft found a considerable reduction of the blood calcium in the tuberculous with diarrhea, a rather slight decrease in dysentery, and a normal amount in acute enteritis. They assume that the hypocalcemia in a chronic diarrhea is produced by the exaggerated elimination. Logically, calcium therapy is indicated in these cases, especially in the tuberculous with diarrhea.

Administration of Insulin by the Tongue.—Blum's opinion is that the administration of insulin by spreading it on the tongue is as efficient as by injection. Insulin, in the dose of 10 mg. spread on the tongue, reduced in three hours in one nondiabetic subject the amount of sugar in the blood from 0.085 per cent. to 0.062, and in another from 0.180 to 0.095. The dose has to be several times larger than by injection.

Variations in Arterial Pressure During Laparotomies.—Simon and Fontaine relate that in laparotomies under a local anesthetic the opening of the abdominal wall is accompanied by a transient hypertension, soon followed by a drop in the pressure and amplitude of the pulse. General ether anesthesia causes the same effect but the consecutive decrease of the pressure is less pronounced. They ascribe the decrease of pressure to the painful traction on nerves. In a case of gastro-enterostomy in which all traction had been avoided, the decrease was hardly noticeable. Blocking the gastric nerves in the rabbit prevented fluctuations in the blood pressure in operations on the stomach, and they advise in the clinic that an anesthetic should be injected into the mesentery in addition to the local parietal or the general anesthesia.

Reciprocal Action of Scurvy and Tuberculosis.—Mouriquand, Rochaix and Michel's experiments on guinea-pigs proved that the presence of tuberculosis has no influence on the appearance and development of acute or chronic scurvy, but the development of tuberculosis later is more rapid in a phase of vitamin deficiency. Guinea-pigs submitted to a prolonged vitamin C deficiency diet (142 days) manifested a marked resistance to the tubercle bacillus during the first three weeks. After this phase the disease progressed rapidly, especially in the lungs. It may be possible to create experimentally in the organism conditions predisposing to a different form of infection with the same bacilli.

Congenital Malaria.—In Castro Freire's case the mother contracted malaria near term. At 6 weeks of age the infant presented, among other signs of malaria, enlargement of the spleen. Intensive treatment with quinin and arsphenamin was followed by complete recovery.

Research on Schick Test.—Assis Brito Filho noted the most frequent occurring of a positive Schick test in children from 2 to 6 years of age. The Schick test made in thirty-six cases

of diphtheria from half an hour to twenty-four hours after the injection of diphtheria antitoxin, proved to be positive in 58.3 per cent. The test given in twenty-three cases before injection showed positive reaction in 95.7 per cent.

91: 237-324 (July 4) 1924. Partial Index

Tetanus Anatoxin. P. Descombey.—p. 239.
*Survival of Spirochetes in Bedbugs. C. Bonne.—p. 242.
*Nonspecific Immunity. L. Képinov.—p. 244.
*Glycolysis and Blood Phosphorus. Bierry and Moquet.—p. 250.
*Tubercle Bacilli and Magnesium Sulphate. L. H. Manceaux.—p. 255.
*Tuberculin Tests After Operations. Decressac and Jacquelin.—p. 272.
*Mechanism of Muscular Contracture. A. Schwartz and A. Oschmann. —p. 275.
Influence of Sunlight on Appearance of Spontaneous Tumors in Mice. A. de Coulon.—p. 280.
*Carbohydrates in Potatoes. F. Schmid.—p. 287.
*Hyperglycemia Checks Insulin Secretion. M. Arnovlyévitch.—p. 287.
*Epinephrin and Urea Content of Blood. Dubois and Polonovski.—p. 293.
Retrosternal Adipose Body (Thymus). Olivier and Bataille.—p. 295.
Complement Fixation in Diagnosis of Typhoid. Vogelin and Gernez.—p. 297.
Production of Hemolysins Through the Epidermis. C. Gernez.—p. 299.
*Intradermal Reaction to Enterococcus. Gernez and Razemon.—p. 301.
*Mishaps in Vaccine Production in Rabbits. Huon and Placidi.—p. 308.
Passage of Bismuth into Cerebrospinal Fluid. Olmer et al.—p. 310.
*Effects on Toads of Removal of Pituitary. Giusti and Houssay.—p. 313.

Transmission of Spirochetosis by Bedbugs.—The research on guinea-pigs reported apparently demonstrates that *Spirochaeta icterohemorrhagiae* can retain its virulence in the bedbug for two days at least.

Nonspecific Immunity.—Képinov announces that filtrates of the prodigiosus and the proteus protect guinea-pigs against lethal doses of cholera vibrios more effectually than vaccines made from the cholera vibrios themselves. Experiments with milk and albumose were negative.

Glycolysis and Phosphorus in the Blood.—The variations in the inorganic phosphorus in defibrinated blood during physiologic glycolysis seem to indicate that the glucose takes the form of phosphoric hexose in the blood corpuscles before becoming transformed into d-lactic acid.

Tubercle Bacilli and Magnesium Sulphate.—Manceaux added the magnesium sulphate to a potato medium and found that the tubercle bacilli (bovine) thrived on it up to a concentration of 20 per cent., and even at 30 per cent. the cultures never failed to infect guinea-pigs.

Tuberculin Tests After Operations.—Decressac and Jacquelin obtained only 73 per cent. positive reactions in eighty-six patients after operations. They ascribe this to postoperative anergy, most pronounced after ether.

Mechanism of Muscular Contractions.—The free phosphoric acid in the contracted muscles of frogs poisoned with monobromacetic acid is not increased, but keeps below the normal range.

The Carbohydrate Content of Potatoes.—The carbohydrate content may vary by 38 per cent. between old and new potatoes, the latter having the least.

Inhibiting Action of Hyperglycemia on Secretion of Insulin.—Arnovlyévitch maintains his contention that with equal glycemias the combustions are equal, given equal insulinemia. This is confirmed anew by the reduction in the insulinemia in animals he injected with glucose, compared with those injected with insulin alone.

Influence of Epinephrin on Urea in Blood.—In dogs and rabbits, injection of epinephrin increased the urea content of the blood, testifying to augmented production of urea. Glycosuria was noted at the same time. The epinephrin seems to act in the same way on both the glycogen producing and urea producing functions.

Intradermal Enterococcus Vaccine Test.—The test was positive in eleven of sixty subjects tested, while complement fixation was variable in this group. The immunization may be effectual and yet the production of antibodies may not be intense enough to induce complement fixation.

Generalized Vaccinia in Rabbits.—The rabbits were those used in production of vaccine. Rabbits are evidently unusually susceptible to a slight increase in the area scarified or increase in the concentration. Huon and Placidi never had such accidents in the 1,450 calves and 550 asses treated proportionately.

Effects of Removal of the Pituitary.—Giusti and Houssay noted regularly in toads, after entire removal of the pituitary, black pigmentation of the cuticle, intense atrophy of the testes, and frequently abortion in gravid females. After mere puncture of the infundibulum-tuber region, there was no pigmentation and no atrophy of the testes.

Encéphale, Paris

19: 337-408 (June) 1924

Concussion of the Spine. André-Thomas.—p. 337.
Unconscious Organization of Memories. Claude and de Saussure.—p. 360.
Obsession of Being Influenced. A. Ceillier.—p. 370. Conc'n.
*Alzheimer's Disease. C. I. Urechia and C. Danetz.—p. 382.

Alzheimer's Disease.—Urechia and Danetz add a new case, with necropsy, to the sixty on record to date. Nothing abnormal could be noted in the woman's antecedents. The disease started at the age of 37 with progressive amnesia and apathy. Lumbar puncture was negative.

Lyon Chirurgical

21: 257-396 (June) 1924

*The Digital Glomus. P. Masson.—p. 257.
*Operative Injury of Bile Ducts. Zabala and Bengolea.—p. 281.
*Hernia of Appendices Epiploicae. M. Patel and P. Mallet-Guy.—p. 287.
Early Suprapubic Cystostomy in Injury of Spinal Cord. Wertheimer. —p. 309.

The Glomus of Tactile Regions.—Masson's attention was attracted to the neuromyo-arterial glomus in the fingers by a pathologic condition in three cases, manifested by a subungual tumor and pain. His research seems to show that it is an autochthonous organ which transmits to the arteries and capillaries nervous impulses which insure their optimal operation. Its function is somewhat analogous to that of the bundle of His. It includes the nerve ending of Ruffini.

Operative Injury of Bile Ducts.—When the inflammatory process in the bile duct region has welded parts together so that it is almost impossible to remove the gallbladder without injuring the hepatic or common bile duct, Zabala and Bengolea open the gallbladder from the fundus down to the neck, instead of from the neck upward. They resect as much of the gallbladder as necessary, leaving adherent portions unmolested. If the cystic duct proves permeable, the operation can be continued as usual.

Hernia of Appendices Epiploicae.—Patel and Guy summarize thirty cases from the records and their own experience, emphasizing that in resection it is important to sever the pedicle close to the intestine and turn in the stump. This wards off danger of a diverticulum.

Schweizerische medizinische Wochenschrift, Basel

54: 605-624 (July 3) 1924

*Cancer and Endemic Goiter. O. Stiner.—p. 605.
Spontaneous Perforation of Ovarian Cyst. P. Meyer.—p. 611.
Blood Transfusion. L. Bischoff.—p. 616.
Medicine in the United States. F. Haeberlin.—p. 618.

Cancer and Endemic Goiter.—Stiner confirms a parallelism between the frequency of endemic goiter and cancer—especially of the digestive system—in various parts of Switzerland. He attributes both conditions, to a large extent, to improper food which causes the first directly, the other indirectly by injuring the teeth. Iodin prevention of goiter, alone, will not decrease the frequency of cancer.

54: 649-668 (July 17) 1924

*Pathogenesis of "Sterilet" Infection. M. Walthard.—p. 649.
*Dangers of Birth Control by Obturators. A. Reist.—p. 650.
Modern Conception of Predisposition. Hanhart.—p. 659. Conc'n, p. 680.

Pathogenesis of "Sterilet" Infection.—Walthard finds that the intra-uterine rods ("sterilets") used for birth control necessarily cause an infection which is in many instances ascending. The greatest danger is during menstruation. The frequency of sepsis and grave suppurations in the internal genital organs has much increased since this apparatus became popular. He advocates legal prohibition of its sale.

Dangers of Birth Control by Obturators.—Reist observed within a short period seven instances of grave affections of the uterus and adnexa, with two deaths. All were due to the use of intra-uterine pessaries with a long stem, forming a

spring. He also observed an instance of injury from Nassauer's "fructulet"; this is an intra-uterine tube designed to facilitate conception. Every woman who wears a mechanical intra-uterine device of these kinds becomes infected sooner or later. He has compiled from the literature and his own observation seventeen cases of death, sixty-two of septic abortion and four of extra-uterine pregnancy from conceptions occurring in spite of the intra-uterine device.

Pediatria, Naples

32: 761-816 (July 1) 1924

Leukocytosis in Whooping Cough. O. Cozzolino.—p. 761.
*Intradermal Reaction in Measles. S. De Villa.—p. 769.
Experimental Measles. A. Laurinsich.—p. 772.
Agent of Measles in Pharynx and in Koplik's Spots. Vitetti.—p. 781.
*Antibodies in Measles. P. Ritossa.—p. 784.
Aplasia of Muscles. A. De Capite.—p. 789.
Leishmaniasis in Liguria. L. Sabatini.—p. 794.

Intradermal Reaction in Measles.—Villa gave intracutaneous injections of killed cultures of Caronia's alleged agent of measles. The reaction was negative in 52 patients in all stages (including prodromal) of the disease, in 24 children vaccinated with the cultures, and in 18 out of 24 children who had had measles before. It was positive in 15 out of 22 with a negative history of measles.

Antibodies in Measles.—Ritossa found an agglutinin, an opsonin and an amboceptor for Caronia's microbe in the serum of patients with measles. The immune reaction appears in the first days of the disease, increases in strength and is still present after recovery.

32: 817-880 (July 15) 1924

*Etiology of Hydrophobia. G. Caronia and M. B. Sindoni.—p. 817.
Tuberculous Meningitis. S. De Villa and G. Genoese.—p. 824.
*Respiratory Capacity. R. Khârina-Marinucci.—p. 832.
*Mastoid Adenitis. C. Giaume.—p. 850.
*Blood Grouping in Infants. R. Pollitzer and S. Rapisardi.—p. 858.
Diagnosis of Pott's Disease in Children. M. Mitra.—p. 862.

Etiology of Hydrophobia.—Caronia and Sindoni inoculated fixed virus on the Tarozzi-Noguchi medium and incubated it under liquid petrolatum. They observed a very slow development of extremely minute gram-positive cocci. Similar cocci were found in the brain of a child who died from hydrophobia, and of rabbits killed at the beginning of the paralytic stage. Intracranial inoculation of a rabbit with the sixth generation of the culture caused paralysis and death after thirty-eight days.

Respiratory Capacity and Sitting Height. — Khârina-Marinucci compared the sitting height and the respiratory capacity in 960 children. She found constant proportions in normal subjects and important variations in disease.

Mastoid Adenitis.—Giaume has noted enlargement of the retromastoid glands very frequently in children.

Blood Grouping in Infants.—Pollitzer and Rapisardi saw no noticeable agglutination of the mother's erythrocytes by the serum of the infant in fifty cases tested. The mother's serum may agglutinate the infant's corpuscles.

Policlinico, Rome

31: 867-900 (July 7) 1924

Typhoid Vaccination by Mouth. G. Brotzu.—p. 867.
Incarceration of Pregnant Uterus. L. Tomasi.—p. 870.
Postpartum Suppuration of Symphysis. E. Zoli.—p. 871.
Focus of Endemic Goiter in Sardinia. P. Ottonello.—p. 873.
Cystoscopic Diagnosis of Renal Calculi. F. De Meo.—p. 875.

31: 901-931 (July 14) 1924

*Hemolytic Action of Mercuric Iodid. O. Sciarra.—p. 901.
Surgical Treatment of Elephantiasis. G. Samorini.—p. 904.
*Masturbation in Infants. T. M. Balboni.—p. 908.

Hemolytic Action of Mercuric Iodid.—Sciarra found that addition of one drop of a 0.5 per cent. solution of mercuric iodid hemolyzes 1 c.c. of a suspension of erythrocytes, and causes therefore a negative Wassermann reaction. If it is injected in animals, the serum also becomes negative.

Masturbation in Infants.—Balboni reports on two male infants with distinct masturbating practices (friction against the mother, but, in one of the infants, not with other persons) at the age of about 1 year.

31: 933-963 (July 21) 1924

*Induced Anisocoria in Tuberculosis. R. Carusi.—p. 933.
Treatment of Encephalitis with Neo-Arsphenamin. C. Agostini.—p. 938.
*Rapid Reproduction of Hydrothorax. G. Galli.—p. 938.
Fork-Shaped Vial. A. Sacchetti.—p. 941.

Artificially Induced Anisocoria in Tuberculosis.—Carusi had fair diagnostic results with the instillation of 4 per cent. cocain into the conjunctival sac in beginning tuberculosis of the apex. In the majority of the patients, the pupil on the affected side dilated within ten or fifteen minutes more than the other pupil.

Rapid Reproduction of a Hydrothorax in a Syphilitic.—Galli reports the case of a syphilitic with cor bovinum and aortic aneurysm. There was recurring pleural effusion which returned so rapidly that the patient had to be tapped twenty-nine times within seventy-eight days. The total liquid withdrawn amounted to 51 liters.

Riforma Medica, Naples

40: 625-648 (July 7) 1924

Hypofibrinous Blood Crasis. M. Stanzani.—p. 625.
Fracture of the Pelvis. O. Nuzzi.—p. 626.
Obstetrical Rupture of the Uterus. A. Caucci.—p. 631.
Disinfection of Syringes. C. Pacelli.—p. 633.
*Treatment of Enuresis. F. Viola.—p. 633.

Treatment of Enuresis.—Viola prefers epidural injections of physiologic solution of sodium chlorid to every other treatment of enuresis.

Deutsches Archiv für klinische Medizin, Leipzig

144: 177-320 (June) 1924

*Death from Iodin Hyperthyroidism. O. Roth.—p. 177.
*Metabolism in Infectious Endocarditis. H. Gessler.—p. 188.
Micro-Observations on Sweating. I. E. Jürgensen.—p. 193. II.—p. 248.
*Cholesterolemia in Gangrene. N. A. Ssokoloff.—p. 202.
*Kidney Function in Hypertension. O. Klein.—p. 207.
Cancer and Tuberculosis in the Lung. G. Giegler.—p. 223.
*Prolonged PR Interval. H. Deist.—p. 227.
Registration of Breathing. Raffauf and Engelhard.—p. 237.
Styptic Action of Opium. G. Ganter.—p. 258.
Respiration in Emphysema. A. Engelhard.—p. 271.
*Aleukemic Myelosis. P. Szilárd.—p. 286.
*Syphilis and Grave Anemia. F. Hoff.—p. 297.

Death from Iodin Hyperthyroidism.—Roth reports the history and necropsy findings on a girl, aged 21, who had received 9 gm. of potassium iodid within four weeks in treatment of colloid goiter. The patient developed symptoms of toxic goiter within fourteen days after the beginning of the treatment, and died two and one-half months later. A thymicolymphatic state and hypoplasia of the heart and blood vessels acted perhaps as a predisposing cause.

Metabolism in Infectious Endocarditis.—Gessler determined the basal metabolism in seven patients with chronic infectious endocarditis. It was increased (up to 43 per cent.) even in the periods with normal temperature.

Cholesterolemia in Gangrene.—Ssokoloff found approximately normal figures of blood cholesterol in patients with spontaneous gangrene of the extremities. Extirpation of a suprarenal capsule did not change it distinctly.

Kidney Function in Hypertension.—Klein examined the kidney function in 136 patients with permanent hypertension. At least one half of them showed some impairment. He believes that the so-called benign form is a precursor of the malignant sclerosis. Every patient with hypertension is on his way into this stage.

Prolonged PR Interval.—Deist emphasizes the significance of a prolonged PR interval in alleged functional disturbances of the heart. It indicates an affection of the heart muscle in the region of His' bundle.

Aleukemic Myelosis.—Szilárd incubated leukocytes from two patients with aleukemic myelosis, in their own serum and in the serum from healthy persons. The number of these cells diminished more than the number of leukocytes from typical myelogenous leukemia. He believes that this increased fragility is the only reason for the low leukocyte counts in such conditions.

Syphilis and Grave Anemia.—Hoff reports six cases of pernicious anemia in syphilitics. He recommends specific treatment for every patient with apparently cryptogenetic anemia, without regard to the Wassermann test.

Deutsche medizinische Wochenschrift, Leipzig

50: 941-974 (July 11) 1924

*Avoiding Operations in Diphtheria. A. Schlossmann.—p. 941.
Modern Eyeglasses. H. Erggelet.—p. 944. Conc'n, p. 980.
Treatment of Cataract. W. Uhthoff.—p. 946. Cont'd.
*Trichinosis in Karlsruhe. F. Heissen.—p. 948.
Secretin from Spinach. M. Dobreff.—p. 950.
*Sedimentation Speed of Sensitized Corpuscles. Spitzer.—p. 950.
Castration in Hysteria. A. Kutzinski.—p. 951.
Hypnosis from Scientific Standpoint. G. Flatau.—p. 952.
Mechanical Percussion. E. Bock.—p. 953.
Progressive Suppurations in Head Region. A. Harf.—p. 953.
Drip Enema in Puerperal Fever. A. Wagner.—p. 954.
Implantation in Lacrimal Ducts. F. F. Krusius.—p. 954.
Mineral Metabolism and Ion Treatment. Starkenstein.—p. 955. Conc'n.
*A Source of Lead Poisoning. Beintker.—p. 958.
Hygiene of Drifting Labor. E. G. Dresel and C. Grabe.—p. 959.
Examination for Medical Degree. Münzel.—p. 961.
The Title of "Dr." J. Schwalbe.—p. 962.
Report on a Bladder Calculus from 1777. H. J. Peppink.—p. 964.
Radio Control of Fetal Sounds. Neubauer.—p. 965.

Avoiding Tracheotomy and Intubation in Diphtheria.—The frequent deaths after tracheotomy and intubations compelled Schlossmann to try to avoid them as much as possible. Man requires much less air than we think, especially when resting. Therefore the main effort should be directed to procure with narcotics a rest for the child during the twelve or more hours before the antitoxin begins to work. The window should be open, and the cooler the air, the better for the child, who should be well covered and warmed with bottles. The prognosis of his patients improved with the avoiding of tracheotomy or intubation except in the gravest cases.

Trichinosis in Karlsruhe.—Heissen describes an epidemic of about 150 cases of trichinosis. Eosinophilia between 18 and 52 per cent. was the most constant sign; it had no relation to the severity of the disease. The highest figure was obtained in a clinically latent case. Edema of the eyelids was next in frequency. The incubation was between twelve hours and six days. Only one patient died, from acute gastro-enteritis.

Sedimentation Speed of Sensitized Corpuscles.—Spitzer found no differences between the sedimentation speed of erythyrocytes sensitized with hemolysins and those treated with normal serum.

A Source of Lead Poisoning.—Beintker observed lead poisoning in a plant for hardening of wires. The steel wires are heated to 800 C. and cooled in a lead bath of about 500 C.

Klinische Wochenschrift, Berlin

3: 1249-1296 (July 8) 1924

Fundamentals of Norm and Constitution. Kaup.—p. 1249. Cont'd.
*Function of the Cerebellum. K. Goldstein.—p. 1255.
Optic Tract and Optic Center. F. Krause.—p. 1260.
*Action of Epinephrin by Mouth. B. Aschner and H. Pisk.—p. 1265.
*In Vitro Strain of Sarcoma. A. Fischer.—p. 1267.
*Lime-Arsphenamin Treatment. F. Jacobsohn and Sklarz.—p. 1267.
Cerebrospinal Fluid in Children. K. Waltner.—p. 1271.
"Standardization of Insulin." E. Laqueur.—p. 1272.
Reply. F. Depisch et al.—p. 1272.
"Action of Opium Alkaloids on Bowel." J. Pal.—p. 1272.
Reply. G. Ganter.—p. 1272.
*Intratracheal Administration of Insulin. E. Laqueur and A. Grevenstuk.—p. 1273.
*Elimination of Water with Various Salt and H. Ion Content. E. Starkenstein.—p. 1274.
*Sudden Death After Intravenous Injection of Bismuth. Magnus.—p. 1275.
Calcium Treatment. K. Blühdorn.—p. 1276.
*So-Called Vanilla Poisoning. A. Gersbach.—p. 1278.

Function of the Cerebellum.—Goldstein denies the coordinating function of the cerebellum. He believes that neither the balance nor the direction depends on it. Bárány's past-pointing reaction is practically always directed outward, which indicates the direction of primitive automatisms checked normally by the cerebral impulses which are only strengthened by the cerebellum.

Action of Epinephrin by Mouth.—Aschner and Pisk found an increase in blood pressure after ingestion of from 3 to 4 c.c. of a 0.1 per cent. solution of epinephrin. The blood sugar was not increased. The test frequently produces pains and vomiting, especially in ulcer patients. The authors prefer the subcutaneous injection.

In Vitro Strain of Sarcoma.—Fischer made eighty-four passages of a Peyton-Rous chicken sarcoma in vitro. He obtained this result by adding a piece of muscle to the cultures. The sarcoma cells which would otherwise peptolyze the plasma, invade the muscle rapidly, grow and keep their virulence.

Lime-Arsphenamin Treatment.—Jacobsohn and Sklarz produced a lethal shock in guinea-pigs with a combination of otherwise innocuous doses of arsphenamin and potassium. Calcium prevented the death. In arsphenamin-intolerant patients, neo-arsphenamin may be injected in 5 c.c. of a 10 per cent. solution of calcium chlorid.

Intratracheal Administration of Insulin.—Laqueur and Grevenstuk injected insulin into the trachea of rabbits. The effect was the same as with subcutaneous injections.

Elimination of Water with Various Salt and H Ion Content.—Starkenstein attributes the diuretic action of water containing carbon dioxid to its hydrogen ion concentration, but not to a faster resorption from the stomach, as others assume. It produces a better diuresis even when injected intravenously. The effect of the oral ingestion may be due in part to the stimulation of acid gastric secretion.

Sudden Death After Intravenous Injection of Bismuth.—Magnus' patient was treated for recently acquired syphilis with eight injections of 0.6 gm. of neo-arsphenamin. After this he received intravenous injections of a bismuth preparation. He collapsed suddenly and died, after the sixth injection.

So-Called Vanilla Poisoning.—Gersbach confirms Wassermann's findings on the favorable influence of low (0.02 per cent.) concentrations of vanillin on the growth of anaerobes. No effect was noted with paratyphoid bacilli. He believes that the so-called vanilla intoxications, especially with ice cream, are due simply to paratyphoid infection transmitted in the rich basis of the food.

3: 1297-1344 (July 15) 1924

Norms and Constitution. J. Kaup.—p. 1297. Conc'n.
*Pathogenesis of Scarlet Fever. M. H. Kuczynski.—p. 1303.
*Predisposition in Infectious Diseases. Hirszfeld et al.—p. 1308.
*Trousseau's Phenomenon. H. Behrendt and H. Klonk.—p. 1311.
*Treatment of Wounds with Blood Plasma. R. Vogel.—p. 1313.
*Diabetes Refractory to Insulin. W. Falta.—p. 1315.
*Cutaneous Diphtheria Test. K. Kassowitz.—p. 1317.
Urobilinometer. G. Tützer and A. Adler.—p. 1318.
*"Sugar Metabolism in Menstruation." Frey.—p. 1319. Reply. Heilig.—p. 1320.
*Experimental Sympathicotonia. Wohlgemuth and Mochizuki.—p. 1320.
Salt Test in Colloid Reactions. W. Schmitt.—p. 1322.
Modification of Hemolysin Reaction. T. Gruschka.—p. 1322.
*Arm Tonus in Cerebellar Affections. K. Heilmann.—p. 1323.
*Leukorrhea and Its Treatment. R. Salomon.—p. 1324.
Research on Heredity. Jollos.—p. 1327. Conc'n, p. 1369.

Pathogenesis of Scarlet Fever.—Kuczynski examined in Siberia three scarlet fever patients who died in the acute stage. Streptococci were found in their organs. He believes that thrombosis of the capillaries is the basis of the ischemia of the glomeruli. The lesions in the tubules resemble those of mercuric chlorid poisoning. The interstitial infiltration in the kidneys and the periportal infiltrations in the liver contained no streptococci. He believes that all these changes as well as the eruption are due to the action of a poison. Rabbits tolerated comparatively large doses of the streptococci. Eosinophils were always found in these animals during the fever. Liver infiltrates contained eosinophils, and the kidney changes corresponded to those in man. He believes that a true specific streptococcus toxin may be the cause of the changes, since the disease is followed by immunity against scarlet fever but not against streptococcus tonsillitis.

Heredity and Predisposition in Infectious Diseases.—H. and L. Hirszfeld and Brokman made the Schick test in fifty families (both parents in forty-two) with 105 children. The blood groups were previously determined. They found that in this small material a predisposition was present in the children whose blood group was identical with that of a predisposed parent. Every blood character may carry with it immunity or predisposition. They believe that there is an immunobiologic inferiority of susceptible children from susceptible parents when compared with the predisposition of susceptible children from immune parents.

Trousseau's Phenomenon.—Behrendt and Klonk attribute Trousseau's phenomenon to the pressure on the tonus nerve fibers and to the locally lowered calcium ion concentration in the blood. Deficiency in oxygen may be an additional factor.

Treatment of Wounds with Blood Plasma.—Vogel uses citrated plasma, from man and cattle, for hemostasis in wounds. He mixes 100 c.c. of blood with 8.5 c.c. of a 2 per cent. solution of sodium citrate and centrifugates it. Addition of 5 per cent. by volume of a 4.5 per cent. solution of calcium chlorid induces coagulation of the plasma within two minutes when it is heated to 38 C. He had good results in prostatectomies (instead of using tampons), gallbladder operations and plastic operations.

Diabetes Refractory to Insulin.—Falta reports on a case of diabetes which was practically refractory to insulin. Intravenous injections were followed by an increase in blood sugar after a slight and short lowering. The patient was corpulent. The sella turcica was small, and the basal metabolism minus 17 per cent. The author believes that the patient has sufficient insulin but that it is prevented from action.

Cutaneous Diphtheria Test.—Kassowitz made in 182 children parallel Schick and skin tests with concentrated diphtheria toxin, using Pirquet's instrument. The readings after forty-eight hours were practically identical with both technics. He recommends the cutaneous method for examination of larger numbers of children. Schick made his first tests with it, but abandoned it later for the supposedly more exact intracutaneous injection.

"Sugar Metabolism in Menstruation."—Frey observed at the height of a labor pain an increase in blood sugar amounting to 20 or 30 per cent. of its level in the interval. Irritation of the uterine cervix always induces hyperglycemia. The menstrual blood acts in a similar way, and this stimulation of the visceral nervous system is increased by ingestion of glucose. Consequently alimentary hyperglycemia is more pronounced during menstruation.

Experimental Sympathicotonia.—Wohlgemuth and Mochizuki produce a chronic sympathicotonia in rabbits by ligating the pancreatic duct. The condition develops in about three or four weeks. The blood sugar increases; the tolerance decreases; the pupil dilates after epinephrin, and pilocarpin lowers the blood sugar. The condition lasts for months and may develop into diabetes.

Arm Tonus in Cerebellar Affections.—Hellmann recommends Wodak and Fischer's arm tonus reaction in diagnosis of cerebellar tumors. Vestibular stimuli cause a unilateral change in the sensation of gravity. This accounts for the lowering of one of the arms extended horizontally forward. The test should last as long as possible (fifteen minutes) or be repeated with short intervals of rest. The spontaneous reaction in Wodak's and the author's cases was not changed by vestibular stimuli.

Leukorrhea and Its Treatment.—Salomon warns against attempts to disinfect the vagina by killing all the microbes. The noxious germs have to be suppressed by promoting the proliferation of the bacilli which condition a normal secretion. Daily douches with a liter of 0.5 per cent. solution of lactic acid may lead to a normal secretion within eight to seventeen days. If this is not sufficient, intravaginal injections of a few cubic centimeters of fresh milk may help. Chlorosis, asthenia, pulmonary tuberculosis, diabetes and affections of the uterus and adnexa have to be looked for and treated.

Medizinische Klinik, Berlin

20: 957-990 (July 13) 1924

*Summer Heat and Young Infants. H. Rietschel.—p. 957.
*Elimination of Germs. O. Huntemüller.—p. 960.
Shock Treatment of Gastric Ulcer. G. Holler.—p. 964.
*Metabolism in Affections of Circulation. F. Kisch.—p. 968.
*Action of Acratothermae. A. Klug.—p. 971.
*Inhalation Treatment of Tuberculosis. A. Moeller.—p. 972.
Perception of Objects. M. Löwy.—p. 975.
Recent Progress in Neurology. A. Stern.—p. 979.

Summer Heat and Young Infants.—Rietschel discusses the pathogenesis of the summer disorder of young infants which was classically described by Rush. Sour milk is certainly not the cause—in fact it is tolerated rather better than sterilized food. The physical action of heat is the main factor. It takes a few weeks before the walls of the houses are heated. Therefore, the increase in mortality follows the peak of the heat. Not only acute hyperthermic conditions resembling sunstroke, but also, and more frequently, a chronic lowering of resistance occur in young infants kept dressed in overheated rooms. The relative immunity of breast-fed babies is due to the fact that they regulate the food intake, and to the comparatively low protein content of human milk. Artificially fed infants suffer from overfeeding with milk and with preparations with a marked specific dynamic action. Few mothers understand that a baby may cry on account of thirst without being hungry. Concentrated food is especially dangerous, since it increases the exsiccation of the body. The child should be kept in the coolest room, and given water to drink. Lukewarm baths or dressings are better than cold ones.

Elimination of Germs.—Huntemüller incubates bile or tissues in alkaline bouillon. This increases the percentage of positive results. While colon bacilli are predominant in direct cultures from cases of cholecystitis, with his method he found staphylococci in more instances.

Metabolism in Affections of Circulation.—Kisch noted an increased basal metabolism only in dyspneic patients with affections of the mitral valve. Aortic insufficiency causes as a rule an increase in metabolism which he attributes to the increased work of the hypertrophic heart. He believes that this accounts for only a fraction of the increased metabolism in essential hypertension. Dyspnea and endocrine influences may be contributing causes.

Action of Acratothermae.—Klug observed, after six days, dilatation of the pupil with visual disturbances and headaches in persons who were diving and bathing daily for about thirty minutes in the natural warm spring water of Janske Lazne, which contains very little mineral substances. A boy who was bathing for more than an hour presented signs resembling atropin intoxication. Another patient suffered a relapse of glaucoma. He explains the action of the thermal water as an inhibition of the parasympathetic.

Inhalation Treatment of Tuberculosis.—Moeller saw only negative results in patients sent by him for Wenninger's inhalation treatment. He would favor a law for the protection of the tuberculous against new remedies.

Monatsschrift für Kinderheilkunde, Leipzig

28: 193-288 (June) 1924

Bilocular Heart with Situs Inversus. O. Corsdress.—p. 193.
Mongolian Blue Spot with Deformities. O. Bruch.—p. 199.
Pleurisy Versus Abnormal Lobe of Lung. F. Ettig.—p. 207.
*Hemolytic Jaundice in Children. Beck.—p. 215.
*Fatal Aspiration of Food in Young Infants. R. Rühle.—p. 223.
Physical Proportions of Growing Children. J. Peiser.—p. 227.
*Pseudohemophilia. E. Breckoff.—p. 232.
*Adult's Blood in Prophylaxis of Measles. H. Gerlach.—236.
*Diathermy in Acute Spinal Paralysis. H. Picard.—p. 242.

Hemolytic Jaundice in Children.—Beck describes a case in a male infant of 5 months. The family was healthy. The reaction to transfusion of 15 c.c. of citrated blood was so severe that this method had to be abandoned and only small amounts of blood were injected intramuscularly. After several periods of exacerbation the enlarged spleen was removed, and the jaundice began to subside almost at once. In two weeks the erythrocytes had risen from 1,468,000 to 4,720,000 and the hemoglobin from 30 to 77 per cent. In two other patients, boys of 9 and 11, the hemolytic jaundice accompanied steeple skull; seventeen cases of this association have been published. Two of the older boy's brothers and sisters had steeple skull and the blood showed distinct anisomicrocytosis but there was no jaundice or splenomegaly. The resistance quotient was 0.44 and 0.56.

Suffocation of Infant from Thick Gruel.—Rühle reports three instances of aspiration pneumonia or direct suffocation of infants, aged from 1 to 5 months, for whom thick gruel had been ordered to combat pylorospasm, dysentery or prolapse of the rectum. Necropsy showed the pasty particles in

the trachea or lung. Fluids getting into the air passages seem to be coughed up more readily than thicker food.

Pseudohemophilia.—Breckoff describes the later history of the boy, aged 9, whose case was published in 1920 as an instance of pseudohemophilia from lack of fibrinogen. After a four year remission the symptoms returned; the blood did not coagulate in the course of a week and the bleeding from a prick in the ear showed no signs of arrest in forty-eight hours. Four days after intravascular transfusion of 400 c.c. of blood the bleeding time was five minutes; time of coagulation, twenty-five minutes, with hemoglobin 80 per cent. The tenth day the blood responded to various tests as within normal range, but by another week the blood did not coagulate in forty-eight hours, showing that the fibrinogen introduced in the transfused blood had been gradually digested. The bleeding time, however, persisted normal during the six weeks of observation, and there were no further hemorrhages. He thinks we must accept some influence on the walls of the vessels in addition to the state of the blood itself as responsible for the symptoms suggesting hemophilia. An abscess in the gum seemed to have been responsible for the flaring up of the hemorrhagic tendency. In Opitz' case the flaring up followed vaccination.

Prophylaxis of Measles with Adults' Blood.—Gerlach says that the results were disappointing from injection of defibrinated blood from adults in prophylaxis of measles unless the amount was 30 c.c. in infants 3 to 20 months old; older children required 40 c.c. Only one developed measles in the group of fifteen infants treated with from 23 to 30 c.c. of the blood, and none of the three other children, with 40 c.c. of blood.

Diathermy in Treatment of Paralysis from Epidemic Poliomyelitis.—Picard begins to apply diathermy as soon as the febrile stage is past. He applies it to the part of the spinal cord involved, in fifteen minute sittings, daily at first and then on alternate days, for a two months' course. It is based on the theoretical assumption that edema in the region is an important factor in the disturbances; this edema may subside under the diathermy while the latter stimulates the circulation throughout the region and may have a bactericidal action. The influence of the electric current may also aid in repair. He gives the details of thirty-one cases thus treated, with recovery of 66.6 per cent. of the twenty-nine that completed the course. The Bordier-Bergamini method is quite different; this applies the diathermy only to the legs, with roentgen exposures of the spine, and has a record of only 28.6 per cent. recoveries in the sixteen cases that have been published (mentioned in THE JOURNAL, Nov. 10, 1923, p. 1643).

Münchener medizinische Wochenschrift, Munich

71: 931-970 (July 11) 1924

*Postoperative Paralytic Ileus. A. Mayer.—p. 931.
*Colloid Treatment. II. H. Bechhold.—p. 932.
Treatment of Inflammations and Cancers. E. Andersen.—p. 933.
Suboccipital Puncture in Epidemic Meningitis. A. Hartwich.—p. 935.
*Myogenous Pains and Stiffness. A. Müller.—p. 936.
The Iron Question. O. Baumgarten.—p. 938.
*Prognosis of Pernicious Anemia. I. Zadek.—p. 940.
*Pernicious Anemia from Taenia Solium. T. Dervis.—p. 942.
Sodium Hydroxid Experiment in Mastic Test. K. Lenzberg.—p. 942.
*Arsphenamin Injuries. II. F. Maerz.—p. 943.
Treatment of Acute Serous Peritonitis. H. Tichy.—p. 944.
Ileocecal Cancer Mistaken for Ovarian Cyst. H. Pollack.—p. 944.
Syringe for Intravenous Injections. M. and H. Rothschild.—p. 945.
*Diagnosis of Meningitis. O. Herz.—p. 946.
"Twin Pathology." H. W. Siemens.—p. 946.
Vasomotor and Trophic Neuroses. H. Curschmann.—p. 946.
Mother and Child Welfare Work in Ukraine. Feder.—p. 949.
Birth Statistics. E. Maurer.—p. 950.
Medical Certificates for Candidates and for Pensions. Mayr.—p. 951.
Medical Tribunals of Honor. A. Stauder.—p. 953.
*Diagnosis of Mammary Cancer. Steinthal.—p. 954.

Postoperative Paralytic Ileus.—Mayer makes a slow intravenous infusion of from 500 to 1,000 c.c. of physiologic sodium chlorid solution with from 4 to 8 c.c. of pituitary extract. The infusion may be given by the drip technic. The bowels soon moved in 70 per cent. of his fifty-two cases. Nevertheless many of these patients died. He considers the 10 per cent. of recoveries he saw as very good. If the bowels move after the infusion, mechanical ileus is improbable. According to the author, some surgeons use enterostomy in the treatment of ileus as freely as others use castor oil.

Colloid Treatment.—Bechhold finds that none of the explanations of the therapeutic action of various colloids is correct. Leukocytosis is in no causal relation to the result.

Myogenous Pains and Stiffness.—Müller sees in the increased tonus of the muscles the basis of pains and stiffness of the shoulder joint, whether they are spontaneous or secondary to injuries. The hard muscles are easily felt in the axilla. The condition is combined with an irritation of the joint which may lead to arthritis deformans. The only safe treatment is early massage of the individual muscles as worked out by the author.

Prognosis of Pernicious Anemia.—Zadek expects a relapse when a patient in the remission stage has increased amounts of urobilin in the stool. A normal or still lower consumption of oxygen by the erythrocytes is a favorable sign, even in fully developed pernicious anemia.

Pernicious Anemia from Taenia Solium.—Dervis' patient recovered completely from hematologically typical pernicious anemia after expulsion of a tapeworm (*Taenia solium*).

Arsphenamin Injuries.—Maerz observed mild encephalitis in one out of five patients all injected with the same solution of neo-arsphenamin. This occurred twice. The injured patients were receiving the third and fourth injection, respectively, while the others were getting their tenth. He attributes the untoward effect to a too rapid involution of syphilitic processes on the cerebral vessels. If an abortive cure is not intended, the first four injections should be small.

Diagnosis of Meningitis.—Herz adds from 1 to 3 drops of a potassium hydroxid solution to the fresh cerebrospinal fluid, and shakes the mixture. If there is a marked increase in the cell content, as in tuberculous meningitis, the fluid stays filled with air bubbles.

Diagnosis of Mammary Cancer.—Steinthal has frequently noted minute depressions in the skin, resembling those of an orange, over a cancer of the breast. The arm has to be abducted if one wants to ascertain the movability of the tumor on the pectoralis major. Then the arm should be adducted and the hand introduced under the muscle to palpate glands on the edge of the pectoralis minor. Not only the axilla but also the edge of the sternum on the opposite side and the intercostal spaces may contain metastases in lymph glands. Enlarged glands, however, are not always cancerous. Paget's disease of the nipple is due to cancer. Bleeding from the nipple is frequently an indication of it. Small abscesses with a hard wall are found sometimes in diabetic women. A diagnostic excision should be accompanied with microscopic examination and, in the event of positive findings immediate radical operation should be done.

Wiener klinische Wochenschrift, Vienna

37: 685-708 (July 10) 1924

Blunders in Diagnosis of Tuberculosis. M. Weinberger.—p. 688.
*Acidosis. L. Hess and J. Goldstein.—p. 689.
Preservation of Serums for Blood Grouping. P. Moritsch and H. Neumüller.—p. 691.
*Vagus Pressure Experiment. S. Erben.—p. 692.
*Receptivity of Reticulo-Endothelial Cells. E. Ledofsky.—p. 694.
Roentgen Ulcers. O. Reimer.—p. 696.
Surgical Treatment of Angina Pectoris. G. Hofer. Supplement, pp. 1-12.

Acidosis.—Hess and Goldstein injected trypan blue in rabbits poisoned with acids. There were necrotic spots in the liver and the reticulo-endothelial cells failed to take up the particles of the vital stain.

Vagus Pressure Experiment.—Erben explained in 1921 the phenomena following compression of the carotid region as results of compression of the jugular vein. A reflex action from increased pressure in the carotid was assumed in 1900 by Pagano and by Siciliano. The author is opposed to Hering's proposal to change the name of the vagus compression experiment to "carotid pressure experiment." The compression of the vein, with the subsequent increase in intracranial pressure and accumulation of carbon dioxid in the brain, would have to be excluded first.

Receptivity of Reticulo-Endothelial Cells. — Ledofsky injected intravenously 20 c.c. of a 33 per cent. solution of

ferrum saccharatum in the last days of life of eight women. The reticulo-endothelial cells took up various amounts of the iron compound, independently of the disease. The differences were due to pathologic changes in the various organs, thus confirming Eppinger's findings.

37: 709-730 (July 17) 1924

Theory of Parenteral Protein Treatment. W. Weichardt.—p. 709. Cone'n, p. 732.
*Individual Treatment of Goiter. F. Kaspar.—p. 713.
*Tetany from Overbreathing. W. Schloss.—p. 717.
*Surgical Treatment of Gastric Ulcer. H. Finsterer.—p. 719.
*Increase in Tolerance After Insulin. J. Güdemann.—p. 721.
Sedimentation Test in Tuberculosis. A. v. Torday.—p. 723.
Intravenous Bismuth Treatment. F. Mras.—p. 724.

Individual Treatment of Goiter.—Kaspar had excellent results in treatment of parenchymatous goiters, especially in children, with extremely small amounts of potassium iodid. Doses of 1 to 4 mg. per month, divided in daily doses, were sufficient. These amounts are too small to produce thyrotoxic symptoms.

Tetany from Overbreathing.—Schloss produced attacks of tetany or some of its symptoms by forced respiration. When the persons were breathing oxygen without forced movements, the experiments were negative. He believes that the movements and not the excessive ventilation are the cause. He suggests that the work of the muscles frees phosphoric acid in them. This enters the circulation and produces tetany. He has observed slight signs of it in athletes after exertion.

Surgical Treatment of Gastric and Duodenal Ulcer.—Finsterer reports on 300 cases of duodenal ulcer with resection of one third to one half of the stomach, without any subsequent jejunal ulcers. This he explains by the anacidity due to the extensive resection. The patient has only slight discomfort in the first months from his "small stomach" if the anastomosis was sufficiently large and if there are no grave adhesions. It is doubtful whether the Billroth I anastomosis, with its higher mortality, will yield better results than the resection.

Increase in Tolerance After Insulin.—Güdemann believes that the insulin treatment increased the carbohydrate tolerance of three of his patients. It seemed that it influenced unfavorably the development of pulmonary tuberculosis in two of them.

Zentralblatt für Chirurgie, Leipzig

51: 1495-1558 (July 12) 1924

*The Acutely Bleeding Gastric Ulcer. F. Erkes.—p. 1496.
*Gastroscope. A. Beck.—p. 1497.
*Own Blood in Furunculosis of Face. W. Linhart.—p. 1501.
Double Test for Blood Grouping. A. Kubanyi.—p. 1503.
Actively Movable Extension Splint. A. Winkelbauer.—p. 1504.
Extension with Nonrusting Wire. A. Beck.—p. 1507.
Surgical and After-Treatment of Mastitis, Felons and Phlegmons of Tendon Sheaths. B. Chatzkelsohn.—p. 1510.
"Picric Acid as Disinfectant." A. Rosenburg.—p. 1515.

Treatment of the Acutely Bleeding Gastric Ulcer.—Erkes ligated en masse the bleeding ulcer, inverted and sutured it, in three cases of chronic recurring bleeding ulcers and in two of acutely bleeding ulcers. No further bleeding has occurred over a period of from one to three years. In nineteen other cases, there was occult bleeding from ulcers of the stomach or duodenum. In only one case did postoperative bleeding of the ulcer occur, and no ligature had been applied.

A Gastroscope.—Beck describes a gastroscope of his own invention, which he finds of great service in inspecting the walls of the stomach and duodenum in the search for ulcers. Only a very small opening in the stomach is necessary to admit the tube of the instrument.

Own Blood in Treatment of Furunculosis.—Linhart has applied in several cases of malignant furuncle on the face Läwen's method of injecting the patient's own blood in a circle around the area of the infection. He injected from 45 to 80 c.c. of blood from the ulnar vein. The infection was checked and the patients recovered rapidly.

51: 1559-1606 (July 19) 1924

Access to Tumor in Cranio-Pharyngeal Canal. Unger.—p. 1560.
Ulnar Abduction as Sequel of Hand Phlegmon. Schoening.—p. 1562.
Infraclavicular Blocking of Brachial Plexus. Balog.—p. 1563.
*Anesthesia in Children. Dreesmann.—p. 1564.
Suture Without Drainage After Cholecystectomy. Bokastoff.—p. 1565.
*Own Blood Treatment of Infected Wounds. Goljanitzki.—p. 1566.
No Tamponing of Suppurating Wounds. N. Blumenthal.—p. 1569.

An Aid in Inducing Anesthesia in Children.—Dreesmann sprinkles on the mask a few drops of cologne. After a minute or two, he begins with the anesthetic. Almost without exception, the children remain calm and go under easily. He has applied the method also in dealing with timid or nervous adults, and, owing to the lack of the psychic shock, the whole course of the anesthesia was often quieter. The cologne may be used again during the anesthesia if the patient begins to rouse.

Own Blood Treatment of Infected Wounds.—Goljanitzki emphasizes that in the healing of infected wounds an increased blood flow to the affected area plays an important part. The swelling of the tissues which accompanies regeneration; the break-down of the the blood cells, and the infiltration of the tissues, all have a special significance in the regenerative process, while whole blood is the only antiseptic agent that has the capacity of destroying bacteria that have invaded the tissues, without killing the tissues themselves. On these principles Goljanitzki has built up his own blood treatment of infected wounds, counting on the cumulative effect of many infinitely small factors. He injects into the tissues about the wound and under the wound a 1:5 own blood solution, with the addition of 0.25 per cent. procain and sodium chlorid up to the normal physiologic solution. During the course of a day or two, he injects from 5 to 25 c.c. This method he uses in all cases in which healing is proceeding too slowly.

Zentralblatt für Gynäkologie, Leipzig

48: 1457-1504 (July 5) 1924

*Intra-Uterine Use of Instruments. H. Sellheim.—p. 1458.
Racial Differences in Constitution. M. Hirsch.—p. 1466.
*Peritoneal and Genital Tuberculosis. W. Uter.—p. 1473.
*Treatment of Eclampsia and the Predisposition. E. Essen-Möller.—p. 1476.
Intermenstrual Pains and Ovarian Dysmenorrhea. J. Novak.—p. 1476.
*Sedimentation Test in Gynecology and Obstetrics. Falta.—p. 1478.
*Idem. X. Bronnikoff.—p. 1483.
Cervical Pregnancy. E. Reinhardt.—p. 1490.

Limits of Control by Sense of Feeling of Instruments in Uterus.—Sellheim warns against the danger of overestimating the ability to tell from the feeling of curet or sound the condition of the uterus lining. In one of the several instructive cases he relates he had curetted the uterus four times without finding any explanation for the slight hemorrhage in the menopause. As he was drawing out the curet the last time, a small polyp came with it, a carcinoma which had escaped detection during all the previous scrapings.

Peritoneal and Genital Tuberculosis.—Uter declares that roentgen-ray treatment surpasses all others in the local and general improvement realized. It never causes fistulas, and, in the small doses used, does not impair the genital functions. In his twenty-four cases, all but three are completely cured; one of these is still under treatment, and the two others are much improved. He gave four to six exposures, beginning with one eighth to one twelfth of the skin dose, and reducing to only a sixteenth or forty-eighth.

Eclampsia.—Essen-Möller relates that in four years of the Stroganoff prophylactic treatment, systematically applied, he has had a death rate of 20 per cent., and has now abandoned this method.

Sedimentation of Erythrocytes Test in Gynecology and Obstetrics.—Falta tested more than 1,000 women, and found the speed always accelerated in pregnant women after the fourth month. The acceleration is extremely pronounced with impending abortion and in hemorrhagic endometritis after abortion, as well as with inflammatory processes in the adnexa, and with cancer.

Sedimentation Test.—Bronnikoff uses the tube from a Sahli hemoglobinometer and records the depth of the plasma column at half hour intervals. It differentiates at a glance inflammatory processes from the noninflammatory, is a gage of the intensity of the inflammation, and may reveal the presence

of unsuspected inflammation before an operation. The speed may persist accelerated for some time after the inflammation has healed.

48: 1505-1568 (July 12) 1924

Pernicious Anemia in Pregnancy. K. v. Oettingen.—p. 1506.
Duodenal Stenosis from Tumor in New-Born Infant. Hohlbaum.—p. 1512.
*Bilirubin Metabolism in the New-Born. E. Meyer and A. Adler.—p. 1514.
*Urobilin in Excreta of the New-Born. Schulhoff and Adler.—p. 1520.
*The Kielland Forceps. H. Saenger.—p. 1532.
Perforation of Uterus by Dilating Instrument. Hellendall.—p. 1535.
*Resuscitation of New-Born in Asphyxia. A. Wagner.—p. 1538.
The "Genital Trachoma" Question. Fischer and Pasch.—p. 1539.
Occult Intestinal Hemorrhage in Melena Neonatorum. Von Raisz.—p. 1550.
Amenorrhea Complicating Atrophy of Uterus After Childbirth. M. Karlin.—p. 1554.

Bilirubin Metabolism in the New-Born.—Meyer and Adler accept an analogy between latent jaundice in the new-born and catarrhal jaundice later. The appearance of bilirubin in the urine and of granular erythrocytes in the blood testifies against hemolytic jaundice. The findings in fifty children are tabulated.

Urobilin in the Excreta of the New-Born.—The figures and the course of events in seventy infants indicate that the presence of urobilin in the stools and urine is a sign of functional liver disturbance, an evidence of preparedness for jaundice.

The Kielland Forceps.—Saenger remarks that in many of the cases that have been published as instances of Kielland forceps deliveries, the child should have been extracted by cesarean section. It is dangerous for the mother, for the child, and for the obstetrician to apply the Kielland forceps with the head still high in a contracted pelvis. But as forceps for the pelvic outlet, it is easier to apply, and spares the mother and child better than the ordinary types of forceps.

Reanimation in Asphyxia Neonatorum.—In commenting favorably on the baby pulmotor for insufflation of oxygen, Wagner quotes Vesalius' experiments on animals demonstrating the way in which the heart reacts at once to insufflation of air into the trachea. He kept animals alive for hours by insufflation with bellows, confirming the influence of insufflation on the heart by reflex action.

Casopis lekaruv ceskych, Prague

63: 1033-1112 (July 12) 1924. Deyl Memorial Number

*Development of Inferior Oblique Muscle. O. Leser.—p. 1034.
*Treatment of Glaucoma. R. Kadlický.—p. 1035.
*Treatment of Secondary Cataract. B. Slavík.—p. 1041.
*Heterochromia of Iris. J. Janku.—p. 1043.
*Permeability of Conjunctiva for Tubercle Bacilli. Z. Bruckner.—p. 1053.
*Orbicular Phenomenon of Lens. A. Gála.—p. 1066.
Congenital Opacity of Cornea. A. Kreidlová.—p. 1070.
*Cataract in Eczema. J. Kurz.—p. 1072.
*Elephantiasis of Eyelids. Z. Moravec.—p. 1082.
Hemorrhages in Vitreous Body. J. Saska.—p. 1085.
Fistula Operation for Green Cataract. E. Vasek.—p. 1087.
Bismuth Treatment of Syphilis of Eye. V. Vejdovský.—p. 1096.
Vesicles on Cornea. A. Sácha.—p. 1101.

Development of Inferior Oblique Muscle.—Leser found that in the embryonic development of mammals the inferior oblique muscle remains for a long time connected with the inferior rectus.

Treatment of Glaucoma.—Kadlický recommends Hamburger's subconjunctival injection of epinephrin on the day before the operation in glaucoma.

Treatment of Secondary Cataract.—Slavík gives details of his technic of discission of secondary cataracts. He had a series of 152 operations without tearing off Zinn's zone, or having any other untoward result.

Heterochromia.—Janku describes two cases of heterochromia of the iris. It is probable that they represent a peculiar, very chronic, benign form of a miliary tuberculous eruption.

Permeability of Conjunctiva for Tubercle Bacilli.—Bruckner produced a mild type of generalized tuberculous infection in guinea-pigs and rabbits by application of tubercle bacilli on the conjunctiva. The infection was slower in animals in which the lacrimal ducts were obstructed.

Orbicular Phenomenon of Lens.—Gála observed in five senile cataracts movements of the opaque masses in the cortical part of the lens. He also publishes his observation on a peculiar phenomenon produced by the effort to close the eyes while the physician prevents the lids from closing. Besides the Bell and Westphal-Piltz phenomenon, the ciliary muscle contracts and relaxes the zone of Zinn. This causes a change of shape of the lens, with consecutive movements of the masses, described above. He calls it the orbicular phenomenon of the lens.

Cataract in Eczema.—Kurz describes a case of posterior cortical cataract in a girl, aged 22, with recurrent eczema of hands and neck, for which she had been irradiated with roentgen rays. He believes that the parathyroids might have been injured.

Elephantiasis of Eyelids.—Moravec observed a patient with elephantiasis of the lids, due to hereditary neurofibromatosis. There was also a dermoid of the orbit, and coloboma of retina and iris.

Finska Läkaresällskapets Handlingar, Helsingfors

66: 355-506 (June) 1924

*Tuberculosis of Bronchial Glands in Children. W. Pipping.—p. 355.
*The Tonsils in Acute Rheumatism. O. Holsti.—p. 365.
*Iodin Treatment of Hyperthyroidism. J. Wahlberg.—p. 385.
*Caisson Disease. J. C. Sjöblom.—p. 398.
Research on Capillary Circulation. E. Hisinger-Jägerskiöld.—p. 405.
Case of Primary Abdominal Pregnancy. J. Meyer.—p. 433.
Ophthalmologic Experience in Egypt. E. Enroth.—p. 457.
Predilection of Deliveries for Certain Hours. Boije.—465.
Etiology of Dyspepsia Preceding Tuberculosis. Buch.—p. 468.

Tuberculosis of Bronchial Glands in Children.—Pipping reminds us that a glandular process is not inevitably tuberculous, and that slight fever may be due to some insignificant nasopharyngeal affection or to overexertion. With tuberculous bronchial glands in infants, there is often a peculiar metallic ring to the cough, and dyspnea in expiration.

Tonsils in Relation to Articular Rheumatism.—Holsti found slight chronic inflammation in the tonsils of 8 presumably healthy persons killed in accidents. The tonsils were supposedly normal. In 43 cases of acute or chronic rheumatism, on the other hand, ulceration or necrosis was manifest in two thirds of the tonsils, and the others showed mild inflammatory processes. In 72 cases of death from some disease that had not involved the joints, the tonsils resembled those in the normal group. In the cardiovascular and acute infectious disease cases, the superficial inflammation was a little more pronounced than in the normal cases but still far less than in the articular rheumatism cases. There was a history of attacks of tonsillitis in 76.8 per cent. of these latter cases; a recent attack was recorded in 71.4 per cent. of the acute cases, and in 47.3 per cent. of the cases of recurring acute articular rheumatism. The tonsillitis persisted in some of the cases long after the subsidence of the joint affection. The data presented confirm, he declares, that ulcerative tonsillitis is a regular link in the chain of rheumatic disease.

Iodin Treatment of Hyperthyroidism.—Wahlberg's treatment differs from the usual technics in that he uses only minute doses, never more than 0.04 gm. of potassium iodid. He gave at most 15 drops a day of a 1:20 solution, and all his nine patients thus treated materially improved and five can be regarded as cured. In the others, the improvement was transient, and in some the condition was graver at the close of treatment than before. He ascribes this to cumulative action from too long continuance of the optimal dose.

Caisson Disease.—Sjöblom states that the divers' paralysis in one of the two cases he describes improved to such an extent that the man is able to walk on level ground, but tires readily. In the second case the spastic paralysis has persisted unmodified; the urine is infected and there is severe obstipation. The man was allowed 100 per cent. workmen's compensation for life. Both were young, robust men. In the first case the paralysis came on gradually in four hours after the worker had returned to the surface rather more rapidly than usual. Treatment was with potassium iodid, hexamethylenamin, massage and tepid baths; in less than a month he was walking with crutches.